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A.M.A. SESSION • ATLANTIC CITY, N. J. • JUNE 7-11, 1937

ENDOCRINE DISTURBANCES

The September Number of the *"Medical Clinics of North America"*—from Washington University and the hospitals of St. Louis—contains a *5-clinic Symposium (70 pages) on "Endocrine Disturbances."* This Symposium includes borderline cases of hypothyroidism, hyperthyroidism, diabetes, adrenal insufficiency, spontaneous hypoglycemia, and adrenal cortical tumors and pituitary basophilism.

There is a clinic on the Diagnosis and Treatment of Endocrine Infantilism; another on Obesity; another on the Treatment of Pituitary Insufficiency and Pituitary Hyperfunction; and still another on Diagnosis and Treatment of Hyperinsulinism.

But even this isn't all that you get in the September Number of these *"Medical Clinics."* In addition, there are *18 other Clinics* on subjects of equal importance to the family physician. There is a fine clinic on Encephalitis; one on Early Diagnosis and Treatment of Emphysema; another on Peptic Ulcer; another on Pulmonary Bleeding. The Silicosis problem is discussed. You are told the significance of Abnormal Cardiac Rhythms. You are given the Treatment of Gonorrheal Vaginitis, of Myocardial Insufficiency, of Functional Disorders in Children, and a number of other clinics.

All previous numbers of the "Medical Clinics" for the past two years have *sold completely out of print.* We suggest, therefore, that if you wish to begin your subscription with the September Number, you use *at once* the coupon on Page 3.

Complete Contents in SAUNDERS ADVERTISEMENT—Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "MI." Medicolegal; "ME." Medical Economics

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DELIVERY AND CARE OF THE NEW-BORN INFANT OF THE DIABETIC MOTHER

LAWRENCE M. RANDALL, M.D.
AND
EDWARD H. RYNEARSON, M.D.
ROCHESTER, MINN.

Priscilla White [1] recently has written a most comprehensive article on the problems which arise when a diabetic woman becomes pregnant. It is not our purpose to reconsider this entire subject but rather to offer suggestions for one of its phases; namely, the delivery and care of the new-born infant.

Prior to the discovery of insulin, pregnancy for the diabetic woman was particularly dangerous. Fortunately, then, the fertility of diabetic women was low and few of them conceived; a high percentage of those who did conceive died, as did most of the infants. Since the discovery of insulin the situation has changed. Many of those who have diabetes in childhood now live to reproduce. The fertility of women who have diabetes that has been controlled is higher than was that of diabetic women before insulin was discovered; in addition, diabetes now can be better controlled during pregnancy, so that more infants come to the period of viability. This does not mean that diabetes complicated by pregnancy is no longer a problem; on the contrary, new problems have arisen, chiefly those of reducing fetal mortality. There has been a gratifying decrease in maternal morbidity and mortality.

Prepartum, intrapartum and postpartum deaths of infants of diabetic mothers have maintained a high rate. Priscilla White stated the problem well when she said "Prevention of the death and decay of the over-ripe fetus of the diabetic mother is a challenge today to the obstetrician and research worker in the field of diabetes."

The approach to this problem first involves the consideration of the time and mode of delivery, and, secondly, the postpartum care of the child. In considering the time and mode of delivery it should be emphasized that the obstetrician is not dealing with a normal woman. No matter how well the diabetes is controlled there are too many abnormal factors involved to permit of a casual decision. The usual conceptions of pregnancy are no longer correct when the expectant mother is diabetic. A diabetic woman who becomes pregnant is an abnormal woman who requires special care and consideration. Every effort should be made to keep her condition satisfactory, not only for her sake but because there is an additional life at stake—a life which is in much greater danger than the mother's. As previously mentioned, we believe we know enough about diabetes to prevent the mother's death from that cause, but the important question is how and when should she be delivered to give the baby the best chance? In all probability the baby is going to be large, for 60 per cent of such babies weigh more than 8 pounds (3.6 Kg.), as compared to 9 per cent of babies of normal mothers. This means a more difficult labor if the mother is allowed to go to term. The fact that the baby is large does not mean that it will be healthy; on the contrary, it may be "flabby" and born dead. The incidence of stillbirth in cases in which the mother is diabetic is many times that occurring in normal deliveries. Not only is the child likely to be injured by the difficulties of labor but it often succumbs in utero to the abnormal state existing in the last few weeks of pregnancy. If the child can be spared this abnormal state which culminates in the stress and strain of normal delivery, its chances for life are materially increased. For this reason we advocate delivery by cesarean section in the thirty-sixth or thirty-seventh week of pregnancy, at which time sterilization can be accomplished if permitted and advisable. We agree with White, who said "Premature delivery of the fully developed, though chronologically premature infant of the diabetic mother by cesarean section is the obstetrician's successful answer to the challenge."

What are the immediate dangers confronting this new-born child and how can they be met? Particularly during the third trimester of pregnancy the pancreas of the infant has been attempting to supply the insulin the mother lacked. After birth the child's pancreas continues to overfunction and produces hypoglycemia.

There is ample evidence to support this statement. In 1915 Carlson and Ginsburg [2] removed the pancreas from pregnant bitches that were almost at term and found that diabetes failed to develop in the bitch until after delivery but occurred soon after. This indicated that the fetal pancreas supplied the needed insulin for the diabetic bitch. Bower and Heilbrun [3] reviewed the subsequent efforts to prove and disprove this conclusion. Pack and Barber [4] offered strong support and also answered those critics who doubted the permeability of the pancreas to hormonic transmission, when they injected insulin into the fetuses of goats and produced a decrease in the maternal blood sugar. Britton [5]

From the Section on Obstetrics and Gynecology (Dr. Randall) and the Division of Medicine (Dr. Rynearson), the Mayo Clinic.

1. White, Priscilla: Pregnancy Complicating Diabetes, Surg., Gynec. & Obst. **61**: 324-332 (Sept.) 1935.

2. Carlson, A. S., and Ginsburg, H.: The Influence of Pregnancy on the Hyperglycemia of Pancreatic Diabetes, Am. J. Physiol. **36**: 217-222 (Jan.) 1915.

3. Bowen, B. D., and Heilbrun, Norman: Pregnancy and Diabetes, with a Report of Five Cases and a Review of the Literature, Am. J. M. Sc. **183**: 803-811 (June) 1932.

4. Pack, G. T., and Barber, Donn: The Placental Transmission of Insulin from Fetus to Mother, Am. J. Physiol. **90**: 466 (Oct.) 1929.

5. Britton, S. W.: Maternal and Fetal Blood Sugar Changes Under Various Experimental Conditions, Am. J. Physiol. **95**: 178-185 (Oct.) 1930.

reversed this procedure when he injected insulin into a pregnant cat and studied the fetal blood sugar. He found a decrease in the kitten's blood sugar, which rapidly returned to normal.

The amount of sugar in the blood of normal mothers and infants was studied by Morriss,[6] who found the average value for the mothers' blood sugar to be 135 mg. per hundred cubic centimeters and that for the infants' blood sugar to be 115 mg. per hundred cubic centimeters. Rowley[7] found normal values for blood sugar of the mothers and no significant changes in the amount of sugar in the blood obtained from the umbilical cords. Révész and Turolt[8] found that the value for the sugar in the blood of the umbilical artery was 10.33 per cent lower than for the sugar in the blood of the umbilical vein; the value for the maternal blood sugar was higher than either. The amount of sugar in the mother's blood increased during labor. Schretter and Nevinny[9] and Popova[10] found that the value for the normal infant's blood sugar may be low for several days following birth. This unquestionably is related to the activity of the infant's pancreas. Holzbach[11] found insulin in the pancreas of normal fetuses of all ages, including one fetus that weighed but 21.5 Gm. He also reported a case of diabetes[12] in which the value for the mother's blood sugar increased from 120 to 210 mg. per hundred cubic centimeters within a few hours following the intra-uterine death of her child.

Dubreuil and Anderodias[13] first reported the finding of hypertrophy and hyperplasia of the islands of Langerhans in a fetus of a diabetic mother. Not only were the islands present in large number but they were from thirty to forty times the usual size. This far exceeds the figures of normal fetal island cells as given by Nakamura,[14] who found that the fetal islands were about four times the size of those found among adults but reported none so large as those found in the fetuses of diabetic mothers. Wiener,[15] Gray and Feemster,[16] Holzbach,[17] Lawrence,[18] Nevinny and Schretter,[19] Schretter and Nevinny,[20] Sennewald,[21] Stepp,[22] Ehrich,[23] Gordon[24] and Higgons[25] all have reported cases in which the islands were large and numerous. In cases in which the value for the blood sugar was determined, it was found that the value for the fetal blood sugar was much lower than that for the maternal blood sugar; the former often was so low as to produce the symptoms of hypoglycemia.

There is no doubt that hypoglycemia explains many of the deaths of infants born to diabetic mothers, although in his review Skipper[26] said "The occurrence of fatal hypoglycemia in the child after delivery has not been proved."

In an effort to treat this condition, Wilder and Parsons[27] in 1928 suggested that the infants should be fed immediately after birth. Sennewald successfully treated an infant who had hypoglycemia by administering a solution of dextrose by rectum. Higgons also has reported a successful result.

Our interest in the treatment of fetal hypoglycemia became acute following the successful outcome in a case in which the patient was treated by Dr. Wilder in 1933; this case has been reported in detail elsewhere.[28] Briefly, the child was delivered by cesarean section and shortly thereafter it was found that the value for the capillary blood sugar was 43 mg. per hundred cubic centimeters. At this time the child presented the convulsive movements and cyanosis that are so typical of severe hypoglycemia. By means of intramuscular injections of dextrose and frequent feedings for several days, the child was enabled to live and is still alive and well.

We now report our results in subsequent consecutive cases:

REPORT OF CASES

CASE 1.[29]—*History.*—A married woman first came to the clinic in February 1928 complaining of the typical symptoms of diabetes mellitus, which had been present since the month of her marriage, August 1927. She had lost 17 pounds (7.7 Kg.). She was in her fourth month of pregnancy. She was instructed regarding the proper care of her condition and dismissed with instructions to take 14 units of insulin daily.

She did not return until April 1933, when she reported that this pregnancy had terminated by spontaneous abortion in the sixth month. A second pregnancy terminated in December 1929, the eighth month, with the delivery of a stillborn infant. The third pregnancy terminated spontaneously at seven and a half months in February 1931. This child survived. Her fourth pregnancy terminated in the seventh month in February 1932. The child lived only seven hours.

At the time of the examination, in April 1933, she was found to be in about the tenth week of pregnancy. She had had great difficulty in the control of her diabetes, and frequent severe insulin reactions had occurred. She was instructed in the proper care of her condition and dismissed with instructions to take 50 units of insulin a day. She was warned to avoid insulin reactions. Every effort was made to cooperate with her home physician, who took excellent care of her until she returned to the clinic in the eighth month of pregnancy.

She was admitted to the hospital Sept. 30, 1933, because she had had a severe insulin reaction the day before. Because insulin reactions prove dangerous to the fetus, a cesarean section was performed October 2, at which time the fallopian tubes were resected. Her convalescence was uneventful until

6. Morriss, W. H.: The Obstetrical Significance of the Blood Sugar, with Special Reference to the Placental Interchange, Bull. Johns Hopkins Hosp. **28:** 140-146 (April) 1917.
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16. Gray, S. H., and Feemster, L. C.: Compensatory Hypertrophy and Hyperplasia of the Islands of Langerhans in the Pancreas of a Child Born of a Diabetic Mother, Arch. Path. & Lab. Med. **1:** 348-355 (March) 1926.
17. Holzbach, Ernst: Diabetes und Schwangerschaft, hier besonders die hormonalen Beziehungen zwischen Mutter und Kind, Zentralbl. f. Gynäk. **53:** 641-647 (March 16) 1929.
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29. We are indebted to Dr. W. E. Coulter of Seneca, Ill., for his cooperation in the management of this patient.

5:20 p. m., October 13, when a severe insulin reaction developed. This was associated with hemiplegia but was promptly relieved by orange juice. She was dismissed from the hospital and instructed to take 50 units of insulin daily. She has not had any further trouble or any insulin reactions.

Infant's Record.—The child was a boy who weighed 7½ pounds (3,402 Gm.). The value for the mother's blood sugar was 60 mg. and for blood sugar of the umbilical cord 30 mg. per hundred cubic centimeters. Obviously, the mother had received too much insulin. The infant's blood was not obtained. He was given 10 cc. of 10 per cent solution of dextrose intramuscularly. This dose was repeated one and two hours later. At this time, feedings by mouth were begun; 12.5 cc. of lactic acid-karo formula and 2.5 cc. of a 50 per cent solution of dextrose were administered at each feeding. These feedings were given every two hours for fourteen hours, at the end of which time a regular feeding schedule was instituted. Thirty cc. of lactic acid-karo formula was administered every three hours. The subsequent course was satisfactory.

The first patient was a diabetic woman who had been pregnant four times prior to the present pregnancy and who had only one living child. She was successfully delivered of her baby by cesarean section in the thirty-seventh week.

CASE 2.—*History.*—The patient was first seen in 1932, when she was 30 years of age. Diabetes had been discovered two years previously and had been adequately controlled with a proper diet and 24 units of insulin a day. She consulted us on this occasion for infertility. The problem of pregnancy and diabetes was discussed thoroughly and she was advised against becoming pregnant.

She returned to the clinic April 23, 1934; she had been pregnant for seven months. Her diabetes had become more severe than it had been, and 68 units of insulin daily was required for its control. Her general condition was satisfactory. She was advised to avoid insulin reactions and to return in one month for cesarean section.

Cesarean section was performed at 8 a. m. on May 26, 1934, in the thirty-seventh week of pregnancy. Her postoperative convalescence was satisfactory, and her diabetes became more easily controlled. In August 1934 she reported that she was well and that only 30 units of insulin was required daily.

Infant's Record.—The child was a girl who weighed 8 pounds 11 ounces (3,941 Gm.). There was a marked hydramnion. At the time of the cesarean section the value for the sugar in the mother's venous blood was 180 mg. per hundred cubic centimeters, for the blood sugar of the umbilical cord 88 mg. and for the infant, as determined by the micromethod, 41 mg. The infant was very cyanotic; 10 cc. of a 10 per cent solution of dextrose was administered intramuscularly at once and oxygen was administered. Five cc. of 20 per cent solution of dextrose was administered by mouth each hour for the ensuing twenty-four hours, at which time the feedings of the lactic acid-karo formula were begun. Thirty cc. of the formula was given every two hours. The infant also received 10 cc. of a 20 per cent solution of dextrose by mouth every two hours, alternating with the formula. After twenty-four hours on this schedule, the normal schedule for infant feeding was instituted and the child made normal progress. The value for the infant's capillary blood sugar, which was 41 mg. per hundred cubic centimeters at 4 p. m., in spite of the heavy feeding schedule was only 60 mg. the following morning. From this time on it was perfectly normal.

The second patient had fairly severe diabetes and was delivered of a child by cesarean section at the thirty-seventh week. The child suffered from fetal hypoglycemia but responded well to the treatment outlined. Both mother and daughter made an uneventful convalescence. The occurrence of hydramnion is a not infrequent finding in cases in which diabetic women become pregnant.

CASE 3.[30]—*History.*—A woman first registered at the clinic in 1927, when she was 24 years of age. She had known of the presence of diabetes mellitus for about nine months. She had been married for two years and had not been pregnant. She was instructed in the management of her diabetes and was dismissed with instructions to take 28 units of insulin daily.

She returned to the clinic in June 1934, when she was in the eighth month of her first pregnancy. Her diabetes had been well controlled during her pregnancy. During early pregnancy she had increased her insulin dosage to 45 units because of the attendant nausea and vomiting but had been able to decrease this to 35 units in recent months. There had been some edema of the ankles during the four weeks before her last visit to the clinic, but her blood pressure and ocular fundi were normal and there was no evidence of toxemia.

June 22, 1934, a cesarean section was performed Her diabetes became very difficult to control, but within a few days the patient responded normally and a satisfactory convalescence followed.

Infant's Record.—The baby, who was a boy, weighed 7 pounds (3,175 Gm.). At the time of the operation the value for the mother's blood sugar was 165 mg. per hundred cubic centimeters, for the blood sugar of the umbilical cord 70 mg., and for the infant's blood sugar, as determined by the micromethod, 46 mg. Ten cc. of a 10 per cent solution of dextrose was injected intramuscularly and oxygen was administered. Ten cc. of a 10 per cent solution of dextrose was given by mouth every hour for twenty-four hours. In addition, an effort was made to give 15 cc. of the lactic acid-karo formula every two hours, but these feedings were often regurgitated. At the end of twenty-four hours the administration of dextrose was discontinued and regular feedings of the formula were instituted. For the first three days the child had numerous attacks of muscular twitching and mild convulsive movements, many of which seemed to disappear after feeding. On the fourth day these symptoms disappeared and he made an uneventful recovery. While the value for the blood sugar was not obtained in each of these attacks of twitching, it is likely that the attacks occurred in spite of a normal value for the blood sugar, since a single determination on the morning of each of these days revealed that the value for the blood sugar was normal.

This baby presented as an outstanding symptom of hypoglycemia the development of marked twitchings and convulsive movements, for three days following birth. The subsequent course was normal.

CASE 4.[31]—*History.*—A girl first registered at the clinic in May 1930, when she was 19 years of age. She had had typical symptoms of diabetes mellitus for two weeks. The value for her blood sugar was 200 mg. per hundred cubic centimeters. Her diabetes was readily controlled and she was dismissed with instructions to take 35 units of insulin daily.

She returned to the clinic in January 1931. Her diabetes had been well controlled and the value for her blood sugar was 150 mg. per hundred cubic centimeters. She had been married in the interim, had become pregnant, and had had a miscarriage in the second month of her pregnancy.

She next came to the clinic in November 1931, when she reported that her diabetes had been controlled until she became pregnant three months before. Nausea and vomiting had made control a little difficult, but at this time her diabetes was well controlled and the value for her blood sugar was found to be 83 mg. per hundred cubic centimeters. She was advised as to the proper care of her condition and was dismissed.

She returned to the clinic in March 1932. At that time she had been pregnant for seven months and reported that she had been troubled with nausea and some vomiting for three weeks and that edema of the face and feet had been present for two weeks. Her family physician had found appreciable quantities of albumin and casts in the urine. Otherwise she presented little evidence of toxemia of pregnancy; the chemical composition of the blood and the ocular fundi were essentially normal. In spite of adequate medical care, she expelled a dead fetus March 28, 1932. Her diabetes was controlled and she was dismissed with instructions to take 50 units of insulin daily.

Her next visit was in July 1934, when she was two and a half months pregnant. She had reduced her insulin dosage to 10 units a day until this pregnancy, when control of the diabetes

30. We are indebted to Dr. R. R. Jeffries of Waukon, Iowa, for his cooperation in the management of this patient.

31. We are indebted to Dr. W. J. McCarthy of Madelia, Minn., for his cooperation in the management of this patient.

again became difficult. Her diabetes was controlled, and she was dismissed taking 55 units of insulin daily.

She returned to the clinic Nov. 2, 1934. At this time she was unable to control her diabetes in spite of the fact that she was taking 80 units of insulin daily. Aside from this and in spite of the fact that she had a toxic pruritus of pregnancy, she felt well. There was no evidence of any toxemia of pregnancy, and her ocular fundi were normal. Her diabetes was difficult to control because of the associated presence of a low renal threshold, which minimized the importance of glycosuria and made necessary more frequent determinations of the value for the blood sugar.

Because of her two previous unsuccessful pregnancies and since in the interim we had learned of the importance of fetal hypoglycemia and its treatment, she was advised to remain at the clinic for delivery.

This was accomplished by cesarean section Jan. 4, 1935, in the thirty-sixth week of pregnancy. Her convalescence was uneventful and her diabetes has been satisfactorily controlled since the operation.

Infant's Record.—The child, who was a girl, weighed 6 pounds 11 ounces (3,040 Gm.) and was delivered at 9 a. m. on Jan. 4, 1935. The value for the infant's blood sugar, as determined by the micromethod, was 43 mg. per hundred cubic centimeters, while the value for the sugar in the mother's venous blood was 115 mg. The child was very cyanotic and required aspiration of mucus from the trachea and artificial respiration. She was given intramuscular injections of 10 cc. of a 10 per cent solution of dextrose and 20 cc. of citrated blood, and oxygen was administered. Every hour during the morning, she was given 15 cc. of lactic acid-karo formula. Because of cyanosis, 5 cc. of a 10 per cent solution of dextrose was injected intramuscularly at noon, and beginning at 1 p. m. 10 cc. of a 20 per cent solution was administered hourly by mouth, in addition to the formula. This was continued for two days, during which time her condition remained satisfactory. The value for her blood sugar increased from 43 mg. per hundred cubic centimeters at 9 a. m. to 77 mg. at 4 p. m. and to 133 mg. at 9:30 p. m., on the day of her birth. The value for the blood sugar never became low and two weeks later it was 99 mg. per hundred cubic centimeters. The child's condition has remained satisfactory to the present.

In this case cesarean section was performed in the thirty-sixth week of pregnancy. The mother was suffering from severe diabetes and had had two previous pregnancies; the first had resulted in miscarriage and the second had resulted in a stillbirth at the seventh month of pregnancy. The living child was suffering from hypoglycemia at birth; she responded nicely to treatment. Both mother and child are alive and well.

CASE 5.—*History.*—A woman, aged 28, who came to the clinic July 6, 1935, had been examined at the clinic intermittently for nine years. Her maternal grandfather had died of diabetes and one sister has diabetes. She had had an uneventful pregnancy at the age of 23. Examination at the clinic revealed that she was pregnant and nearing term. The value for the blood sugar was 146 mg. per hundred cubic centimeters. Exton's dextrose tolerance test revealed the following values for the blood sugar: 107, 142 and 230 mg. per hundred cubic centimeters. Diabetic care was instituted and on July 10, 1935, delivery occurred spontaneously. Her postpartum course was uneventful and her diabetes has been easily controlled without the administration of insulin.

Infant's Course.—A male infant, who weighed 3,630 Gm., was delivered at 2:35 a. m., July 10, 1935. The value for the mother's blood sugar was 142 mg. per hundred cubic centimeters and for the sugar in the blood of the umbilical cord 112 mg. The amount of sugar in the infant's blood was not determined at this time. At 3:15 a. m., 10 cc. of a 10 per cent solution of dextrose was injected into the child's buttocks. At hourly intervals, beginning at 5 a. m., 10 cc. of a 20 per cent solution of dextrose was given by mouth. His condition remained good until just after the feeding at 9 a. m., when he became very cyanotic and regurgitated the feeding. The cyanosis of the face cleared rapidly and within twenty minutes his condition was much improved. At this time the value for blood sugar, as determined by the micromethod, was 112 mg. per hundred cubic centimeters. At 10 a. m. he again became cyanotic; artificial respiration was necessary and carbon dioxide and oxygen were administered; mucus was aspirated and 10 cc. of a 10 per cent solution of dextrose was injected into the buttocks. The child was kept in an oxygen concentration of from 55 to 60 per cent; he improved, although muscular twitchings were marked. No difficulty was encountered until 1:30 p. m., when he vomited. Feedings by mouth were discontinued and he was given 10 cc. of a 10 per cent solution of dextrose intramuscularly every two hours. This was continued for twenty-four hours, at the end of which time feedings of the lactic acid-karo formula were begun; 10 cc. of this formula was given every two hours. At this time (July 11) whole lactic acid milk was given and, with the exception of occasional vomiting, no difficulty was encountered. July 12 his condition was good and the muscular twitchings had ceased. The administration of oxygen was discontinued and the infant received the routine care.

Even with a normal value for the blood sugar, this infant had a precarious existence for the first two days, with cyanosis, muscular twitchings and vomiting as outstanding features. Since the mother had such mild diabetes, was at term when first seen and had had an easy labor with her first child, cesarean section was not advised.

CASE 6.—*History.*—The patient registered at the clinic in December 1922, when she was a girl aged 13 years. She had had typical symptoms of diabetes mellitus for six weeks. Her mother was a diabetic patient, and there was a marked familial tendency to obesity. The value for her blood sugar was 169 mg. per hundred cubic centimeters. She was 61 inches (155 cm.) tall and very obese; she weighed 177 pounds (80.3 Kg.). She was instructed in the qualitative restriction of carbohydrates and fats and advised to return in about six months.

She returned in July 1923 and reported that after she had followed the diet for several months she had lost 15 pounds (6.8 Kg.) but that she had become careless and her weight had increased to 170 pounds (77.1 Kg.). She was advised and urged to be more cooperative.

She again returned to the clinic in February 1924, when she weighed 175 pounds (79.4 Kg.). Despite her carelessness, the value for her blood sugar was 98 mg. per hundred cubic centimeters and the dextrose tolerance test showed a normal response.

She was next seen at the clinic in June 1933. At this time she was 24 years old, 5 feet 2 inches (157.5 cm.) tall and weighed 177 pounds (80.3 Kg.). She had not followed our advice but had been most careless and had treated her diabetes only when forced to do so by the development of pruritus vulvae. Her urine contained 8 per cent sugar and the value for her blood sugar was 226 mg. per hundred cubic centimeters. There was no evidence of diabetic retinitis. A daily diet of 550 calories was employed; this was supplemented with vitamins and minerals. By August 21 she had lost 21 pounds (9.5 Kg.) and her diabetes was well controlled. She was dismissed with a stern lecture regarding her negligence.

Shortly thereafter she was married and did not return to the clinic until Aug. 30, 1935; at this time she was pregnant. Her last menstrual period had occurred Dec. 29, 1934, and her expected date of confinement was Oct. 4, 1935. She reported that until she became pregnant her weight had remained between 145 and 150 pounds (65.8 to 68 Kg.). The value for her fasting blood sugar was normal, as were the results of both the standard and the Exton dextrose tolerance tests. Dr. Wagener examined her ocular fundi and found the typical picture of diabetic retinitis but, in addition, saw a definite cotton-wool patch and other evidence of toxic retinitis. Three days later there were more cotton-wool exudates and further advances in the degree of the toxic retinitis. He favored early termination of the pregnancy. The interesting feature is that the retinitis was out of all proportion to the degree either of diabetes or of toxemia of pregnancy. However, because of our faith in the importance of retinal examination and because of the diabetes, a cesarean section was performed September 7. September 10, Dr. Wagener reported as follows: "There now seems to be less activity, and the retinitis probably will recede."

September 27 he found that the evidence of toxic retinitis had largely disappeared, leaving those changes typical of diabetic retinitis. Her convalesence was uneventful.

Infant's Record.—A female child, who weighed 3,624 Gm., was born at 9 a. m. Its general condition was very satisfactory. The value for the sugar in the mother's venous blood was 115 mg. per hundred cubic centimeters, for the sugar in the blood of the umbilical cord 85 mg., and for the infant's blood sugar, as determined by the micromethod, 115 mg. Twenty cc. of a 10 per cent solution of dextrose was injected into the buttocks at the time of delivery, and 10 cc. of this solution was injected each hour until 4 p. m., when feedings of the lactic acid-karo formula were begun by mouth. The value for the infant's blood sugar never was below normal, and with the exception of one episode of cyanosis, which occurred two hours after birth, her clinical course was uneventful.

This patient was an obese young woman who had not taken care of her diabetes and who suffered from a progressive toxic retinitis which necessitated termination of pregnancy by cesarean section. The toxic retinitis improved following this. In this case there was no distinct evidence of fetal hypoglycemia. This may have been attributable to the mild, atypical diabetes of the mother or to the prompt and consecutive injection of dextrose into the infant. It is unusual to see diabetes behave so erratically as it did in this case; at times it was rather severe; at other times it virtually was nonexistent.

CASE 7.[32]—*History.*—A woman who came to the clinic Feb. 10, 1936, was in the thirty-third week of her first pregnancy. She was 30 years of age and had had diabetes for seven years, which had been well controlled with proper diet and insulin. Control of the diabetes had not been difficult during her pregnancy. Her blood pressure and urine had been normal during the early part of her pregnancy and had been normal in December 1935. Two weeks later, marked edema of both legs developed and she consulted her family physician, who found that the value for her blood pressure, expressed in millimeters of mercury, was 170 systolic and 110 diastolic, and that the urine contained albumin, grade 2, on a basis of 4. She had no symptoms other than the edema. She was ordered to remain in bed and a milk diet was advised. Within two weeks the edema had disappeared but the value for the blood pressure remained high and albumin was consistently found in the urine.

At the clinic a specimen of urine, obtained by catheterization, was found to contain a few casts and albumin, grade 4, on a basis of 4. The value for the urea was found to be 50 mg. per hundred cubic centimeters of blood. Examination of the ocular fundi disclosed a diffuse chorioretinitis, which especially involved the maculae and which apparently was inactive. There was a questionable deep hemorrhage in the superior nasal quadrant of the left eye.

As a result of these observations, cesarean section was performed February 12. The postoperative course was uneventful. There was inadequate lactation. The value for the blood urea decreased to normal (28 mg. per hundred cubic centimeters), and the urine contained much less albumin (grade 2 on a basis of 4) than it did at the previous examination; otherwise examination of the urine did not reveal anything abnormal. The blood pressure at the time of her dismissal fourteen days after the operation was 136 mm. of mercury systolic and 96 diastolic. There had not been any change in the ocular fundi.

Infant's Record.—A female infant, who weighed 1,990 Gm., was born at 9 a. m., Feb. 12, 1936. The values for the mother's blood sugar before and after the operation were 142 and 234 mg. per hundred cubic centimeters. Blood from the umbilical cord contained 173 mg. of sugar per hundred cubic centimeters, and the value for the infant's blood sugar, according to the micromethod, was 99 mg. The child was very cyanotic and listless and required artificial respiration and aspiration of tracheal mucus. Five cc. of a 10 per cent solution of dextrose was injected into each buttock and the baby was placed in an incubator in which the oxygen tension was kept at 50 per cent. At noon, 10 cc. of a 10 per cent solution of dextrose was injected into the buttocks and the child was given some water by mouth. Just before the feeding at 3 p. m. the value for the infant's blood sugar, as determined by the micromethod, was found to have decreased to 33 mg. per hundred cubic centimeters. At this time the child was given 10 cc. of a 10 per cent solution of dextrose intramuscularly and 10 cc. of the lactic acid-karo formula by mouth. Cyanosis became pronounced. The feeding was stopped and the child was placed in the oxygen incubator. Within a few minutes her condition had improved and the feeding was finished. A 10 per cent solution of dextrose was administered intramuscularly at 5 and 7 p. m. At 9 o'clock the value for blood sugar was found to be 59 mg. per hundred cubic centimeters. At 9:30 she received another intramuscular injection of the solution of dextrose and another feeding of the formula. During the first night efforts were made to feed the child by mouth with the formula and 10 per cent solution of dextrose, but both were regurgitated and it was necessary to administer a 10 per cent solution of dextrose intramuscularly, every two hours.

Lack of space prevents the detailed report of the child's condition and the treatment, but at noon of the second day of life, muscular twitchings occurred. These were followed in an hour by a mild convulsive seizure and cyanosis. Five cc. of a 10 per cent solution of dextrose was injected into the peritoneal cavity and the condition improved. After this treatment the value for the blood sugar was found to be 187 mg. per hundred cubic centimeters. During the second night and the third day the muscular twitchings were prominent and because of the continued regurgitation of feedings by mouth the child was given intramuscular injections of a 10 per cent solution of dextrose. At 5 p. m. on this day the value for the blood sugar was still low, 66 mg. per hundred cubic centimeters. During the third night and during the fourth day she retained the feedings, and the muscular twitchings were much less frequent than they had been. Intramuscular injections were no longer necessary and the value for the blood sugar was 87 mg. per hundred cubic centimeters. After the fourth day there was no evidence of hypoglycemia and the child gained normally. On the tenth day the oxygen tent was removed.

The toxemia of pregnancy improved following cesarean section. The value for the infant's blood sugar was normal at birth, but hypoglycemia occurred later. This child also demonstrates the fact that the symptoms of hypoglycemia, such as cyanosis, muscular twitchings and convulsions, may occur for days and even after the value for the blood sugar has increased to normal or nearly to normal.

SUMMARY

The mortality among infants born to diabetic mothers has continued high despite advanced knowledge of the treatment of diabetes. We have reported the successful delivery in seven successive cases of diabetic mothers following the principles laid down by Wilder in a case previously reported. In seven of these eight cases[33] cesarean section was performed in the thirty-third or thirty-seventh week. By so doing we have avoided those dangers which arise during the last few weeks of pregnancy and have saved the mother and child from the risk of a difficult labor. Our experience proves the occurrence of hypoglycemia in the infants of diabetic mothers, and it is considered possible, as Higgons has suggested, that some deaths of children born to normal mothers may be the result of hypoglycemia. The latter should be investigated further.

In view of our experience we have instituted the following general plan for the management of the infant of the diabetic mother for the first few days of its life. The length of time that this program will need to be maintained will vary and will depend on the degree of prematurity, the length of time before food and fluid can be taken by mouth, and the duration of the period of readjustment of pancreatic function.

32. We are indebted to Dr. H. W. Satterlee of Lewiston, Minn., for his cooperation in the management of this patient.

33. Since this report was written we have successfully delivered another diabetic woman.

The concentration of sugar in the blood of the mother, the infant and the umbilical cord should be estimated immediately. It would be preferable to obtain separate samples from the umbilical artery and vein. Care should be taken to be certain that the pharynx and trachea are free of mucus and amniotic fluid. This is best accomplished by maintaining the head in a dependent position, although sometimes it is necessary to aspirate with a tracheal catheter. Occasionally inhalation of carbon dioxide and oxygen may be necessary to establish respiration. When respiration has started, the infant is placed in a Hess incubator equipped with a cover and connected with an oxygen tank. The flow of oxygen is regulated in order to maintain an oxygen tension of 40 to 50 per cent for the first few hours. The temperature of the incubator is maintained at 85 F. Five cc. of 10 per cent solution of dextrose is administered into each buttock. Futher injections of 10 cc. of a 10 per cent solution of dextrose are given at intervals regulated by the value for the blood sugar as determined by the micromethod, by the behavior of the infant and by the ability of the infant to take feedings by mouth.

Feeding is attempted within four hours. Ten cc. of a 10 per cent solution of dextrose or 7 cc. of Marriott's lactic acid-karo mixture [34] is given every two hours for the first forty-eight hours if it can be tolerated. Then 30 cc. of lactic acid-karo mixture is given every three hours. Sufficient nursing assistance is secured to permit uninterrupted observation of the infant for the first forty-eight to seventy-two hours. Whenever the feeding is poorly taken or whenever twitchings, convulsive movements or cyanosis indicates the development of hypoglycemia, 10 cc. of a 10 per cent solution of dextrose is given by mouth if possible; otherwise it is administered intramuscularly.

The length of the period of danger from the complications of hypoglycemia cannot be predicted with accuracy. The concentration of oxygen in the incubator gradually is diminished, and when the infant maintains normal color in the ordinary atmosphere the administration of oxygen is discontinued.

34. All the paraphernalia to be used in the making of the lactic acid-karo mixture should be sterilized. The formula for the mixture calls for 70 Gm. of karo syrup and 930 cc. of whole milk. These ingredients are mixed and boiled for fifteen minutes. The mixture is then cooled until ice cold. One hundred and twenty drops of 85 per cent solution of lactic acid is added to the milk and karo mixture, a drop at a time, while the mixture is constantly stirred. Care should be taken not to warm the mixture too much before feeding or it may curdle.

A Bold Theory Concerning the Pituitary.—Histologists and pathologists still differ among themselves as to the proper description of the pituitary, and their lack of unanimity applies in particular to the pars nervosa. Specific functions have still to be found for the hyaline bodies of Herring, for the end-organs of Tello, for the pituicytes of Bucy, and for the epithelial elements in the racemose glands of Lewis and Lee, and those of Guizzetti. However, consideration of these various elements and of the portal circulation recently shown to connect the pituitary and the supra-optic nuclei in the floor of the third ventricle, and the confirmation of the innervation of the infundibular process via the stalk from the supra-optic nuclei make possible the elaboration of an attractive theory concerning the secretion of the pressor substance. At times the basophilic cells themselves may wander directly into the pars nervosa. Secretory products are to be seen in the form of the hyaline or colloid bodies of Herring and the end-organs of Tello, and can pass up the stalk to enter the ventricle directly or may go via the portal system into the general circulation. Such a bold theory can hardly be said to be established by the evidence at hand.—Baumgartner, Leona: Pituitary Basophilism and Hypertension, *Yale J. Biol. & Med.* **7**:327 (March) 1935.

NEOPLASMS OF THE SPINAL CORD

A REVIEW OF FORTY-TWO SURGICAL CASES

R. GLEN SPURLING, M.D.
AND
FRANK H. MAYFIELD, M.D.
LOUISVILLE, KY.

There are but few organs in the human body in which neoplastic disease occurs in a more benign form and the results of surgery are more brilliant than in the spinal cord and its membranes. At the same time there is no organ in which total restoration of function following the removal of the neoplasm is so completely dependent on an early diagnosis. Unfortunately for the victims of spinal cord tumors, still too many of them are treated in the late stages of the disease—often after irreparable damage to the cord has occurred. If this condition is to be corrected, there must be a more general recognition of the early signs and symptoms of the disease and, most of all, there must be a general appreciation of the fact that a spinal cord tumor is not a rare but a relatively common lesion.

Our purpose in this report is to record our experiences over a nine year period in the treatment of forty-two cases of spinal cord tumor surgically. While these experiences have not been strikingly different from the published reports of other authors,[1] we are recording them with the belief that only through repetition and reemphasis of important diagnostic data will more of these lesions be recognized and treated during the early, hopeful stages of the disease.

INCIDENCE

There seems to be no very satisfactory way of arriving at the actual incidence of spinal cord tumors. While postmortem studies have undoubtedly contributed the most reliable figures to date, the incidence as arrived at by these studies is probably misleading

From the Department of Surgery, University of Louisville School of Medicine.

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because of the infrequent practice of removing the spinal cord intact and inspecting carefully the spinal canal in autopsy materials.

Analysis of our own cases indicates the incidence to be considerably greater than that reported by other authors.[2] Approximately 2,700 patients with complaints referable to the nervous system have passed through our office during the past nine years. In this group there have been thirty-seven verified spinal cord tumors, an incidence of 14 per thousand. In this series of office patients there have been 144 verified brain tumors, an incidence of one spinal cord tumor for every four brain tumors.

This group is not remarkable as to age distribution; the youngest patient was 13 years of age and the oldest 73, as shown in the chart. As in most other reported series, there is a preponderance of females, our group consisting of twenty-seven females and fifteen males.

Our statistics would indicate a rarity of spinal cord tumors among the colored race, there being but three Negroes in the group. On the basis of relative population of the two races in this locality, this incidence might appear to be significant, yet we feel that it is not a fair index in view of the disproportion between the medical and hospital facilities available to each race.

PATHOLOGY

Only thirty-nine of the forty-two tumors were verified histologically; in three cases no biopsy was made. The three histologically unverified tumors were exposed at operation and the gross appearance was so characteristic that the diagnosis of neoplasm was to us unquestionable. The following statistics, therefore, are based on thirty-nine microscopically verified tumors and three tumors verified by gross appearance only.

Dividing the forty-two tumors in the conventional manner according to their location with respect to the cord and meninges, we find them distributed as follows: intramedullary, eleven cases; extramedullary but intradural, sixteen cases; extradural, fifteen cases. In the intramedullary group there were five ependymomas, one glioblastoma multiforme, one spongioblastoma unipolare, one hemangioma and three tumors microscopically unverified. The extramedullary but intradural group consisted of nine meningiomas and seven neurofibromas. In the extradural group we found four myeloendotheliomas, three osteochondromas, three metastatic carcinomas, three fibrolipomas, one sarcoma and one neurofibroma of the dumb-bell type.

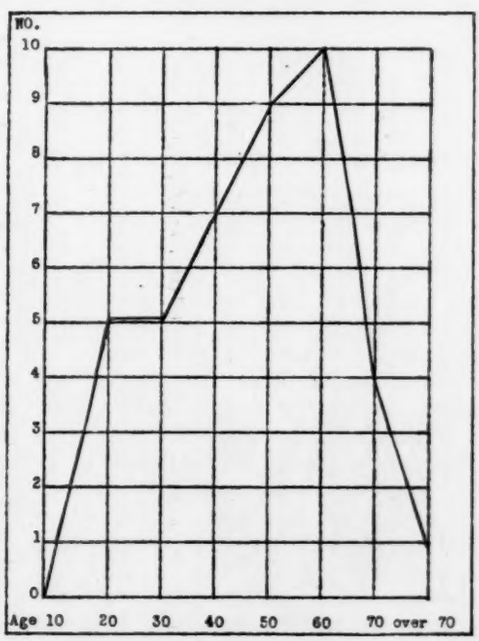
Anatomically, the tumors were distributed with respect to the vertebral column as follows: five cervical, twenty-nine thoracic and eight lumbosacral.

SYMPTOMS AND SIGNS

Since the symptoms and signs of spinal cord tumor are largely dependent on the anatomic location and size of the neoplasm, it is to be expected that each case will present its own diagnostic problems. Some late symptoms, however, are common to all spinal cord neoplasms, notably motor and sensory paralysis and sphincteric disturbances. It is the early symptoms of the slowly growing neoplasm that tax the diagnostic acumen of the physician. Neoplasms may simulate any disease of the spinal cord; therefore, before one arrives at a diagnosis of degenerative disease of the organ an exhaustive study should have been made to exclude the possibility of a spinal cord tumor.

We shall not attempt to enumerate all symptoms and signs presented by the patients of this series. When they were analyzed we found that, while they varied greatly according to the individual mode of expression, they could be grouped satisfactorily under the following general headings:

Pain.—Most authors regard radicular pain as being the first and most prominent symptom of spinal cord tumor.[3] This point of view has been so generally accepted that the diagnosis of tumor is often unnecessarily delayed because pain is absent even though the patient may present definite evidence of segmental cord disease. We believe that the importance of radicular pain as an early symptom has been overemphasized. While it is true that in our series root pain was the most frequent early symptom, it was present as such in but 50 per cent of the cases; in 26.5 per cent pain was absent during the entire course of the disease. In the latter group the length of time elapsing between the onset of symptoms and operation was considerably



Age chart.

longer than in the group having pain; the average interval in patients with pain was twenty-six months and in those without pain was thirty-eight months.

Exaggeration of pain caused by straining at stool, coughing or sneezing was an almost constant finding.

Sensory Disturbances. — Subjective sensory disturbances were present in 83 per cent of our patients, objective sensory loss being present in 76 per cent. Sensory levels were demonstrated in twenty-three cases (55 per cent). In but thirteen of these, however, were we able to establish accurately by clinical examination alone the anatomic location of the lesion. In every case in which a sharply defined level was demonstrable, the patient had already rather advanced motor paralysis. This would indicate that a distinct sensory level is apt to be a late manifestation of the disease, especially when the neoplasm is benign. In analyzing the histories of the patients with sensory levels, we found that most of them had complained of paresthesias, usually in the form of numbness and tingling of the lower extremities, before hypesthesia was recognized. It is in this stage

2. Elsberg.[1] Rogers.[1]

3. Bunts.[1] Craig, W. M.: Pain in Spinal Cord Tumor, W. J. Surg. **40**: 56 (Feb.) 1932. Fremont-Smith, Maurice: Cord Tumor as a Cause of Abdominal Pain, Internat. Clin. **2**: 171 (June) 1926. Kernohan, Woltman and Adson.[1] Tamaki.[1]

of sensory loss that the diagnosis should be made if the best results are to be obtained.

Motor Disturbances.—Muscular weakness in some degree was the first symptom in thirteen cases (31 per cent), and only three patients came to operation without some demonstrable loss of motor power. Nineteen patients were bedridden and had been unable to walk for intervals varying from two months to four years. In most cases the paralysis progressed insidiously. But three of these patients became suddenly paraplegic after having suffered with pain for many months. In four cases motor weakness developed simultaneously with pain and was attributed by the patients to trauma.

Sphincteric Disturbances.—Twenty-six patients (62 per cent) had some degree of sphincteric disturbance preoperatively. In thirteen cases the bladder disturbance was early and in thirteen it appeared late in the disease. In several cases no symptoms referable to the vesical sphincter had been noted, yet a large amount of residual urine was found.

Sympathetic Disturbances.—Horsley was perhaps the first to call attention to the localizing value of vasomotor disturbance in lesions of the spinal cord. A general appreciation of these important signs was stimulated by Fay's [4] report in 1928. He called attention to the color and pilomotor changes as well as to the sweating abnormalities in cases of spinal cord tumor. In our experience, color and pilomotor changes have been of limited value but disturbances of the sweating mechanism have proved most helpful. When a local cord lesion involves directly or indirectly the intermediolateral column of gray matter, the activity of the sweat glands below the level of the lesion is diminished. Below the level of such a lesion the skin is dry, while above this level the skin is moist. The sweat line can be readily demonstrated by gently passing the dry finger tips over the skin from below upward, and when the area of normal sweating is encountered a distinct "pull" or "hang" will be felt. In all our cases showing a distinct sensory line, this test was positive. In a number of cases the sweat line guided us to the correct segmental level of the lesion when sensory examination had proved inconclusive.

Reflexes.—Abnormalities of the deep and superficial reflexes below the level of the lesion were an almost constant finding in this group; in only three instances did the patients come to operation with all reflexes normal. The type of reflex change was invariably dependent on the anatomic location of the lesion, those in the region of the conus and cauda equina showing absence or diminution of the regional tendon reflexes and those higher in the cord showing exaggeration of the tendon reflexes, with or without clonus, and abnormal superficial reflexes. In twenty-two cases (52 per cent) the paraplegia had progressed to the stage at which pathologic toe signs (Babinski, Oppenheim, Gordon or Schäffer) were present. Five patients (11 per cent) had complete paraplegia with "massing" of the reflexes.

The review of the foregoing data has impressed us with the difficulty of differentiating between the symptoms of spinal cord tumor and those arising from disease of other organs. These difficulties are graphically illustrated by the suspected disorders for which many of our patients were treated prior to their final diagnosis. Twenty-seven patients (65 per cent) received treatment for conditions totally irrelevant to the true pathologic condition. Twelve patients (29 per cent) were subjected to surgical operations: six for pelvic pain, two for suspected gallbladder disease, one for cord bladder and three for sciatic neuritis. Fifteen patients were treated for varying periods of time for spinal arthritis, flat feet, multiple sclerosis, combined sclerosis, central nervous system syphilis (negative Wassermann reactions), lead poisoning and herpes zoster.

These facts are not given with critical intent but are listed to emphasize the statement that the symptoms of spinal cord tumor may closely simulate disease of other organs. One of us (R. G. S.) in 1926, while resident surgeon at the Louisville City Hospital, performed a pelvic laparotomy on one of the patients of this group for relief of pelvic pain. Less than nine months later the same surgeon removed a large neurofibroma from one of the lumbar nerves. The symptoms that led to the first operation were in no way explained by the results of the pelvic laparotomy and no relief was experienced. Only after the passage of time were the symptoms so characteristic that the presence of a spinal cord tumor was unmistakable. Undoubtedly the correct diagnosis would have been established before the first operation had a more painstaking neurologic study been made.

The average length of symptoms before operation in the entire group was thirty-seven months. In the majority of cases, when viewed retrospectively, the symptomatology was sufficiently characteristic to have warranted a tentative diagnosis of tumor in the early stages of the disease.

CEREBROSPINAL FLUID

Study of the cerebrospinal fluid is perhaps the most valuable part of the laboratory examination of spinal cord tumor suspects. So much stress has been laid on the importance of this part of the examination, chiefly because of the refinement in the Queckenstedt test, that there seems to be a growing tendency to accept normal cerebrospinal fluid dynamics as positive evidence that no tumor exists.

In this series of patients there were eight instances (19 per cent) in which the cerebrospinal fluid dynamics was recorded as normal. We record the Queckenstedt test as being complete, incomplete and normal according to the following criteria: A complete block is characterized by an immobile column of fluid when deep jugular pressure is applied. Coughing, straining and external abdominal pressure will produce a rise even in the presence of a complete block due to engorgement of the spinal veins below the level of obstruction. An incomplete block is recorded when there is a slow rise of the fluid column after deep jugular pressure and a slow fall after its release. The fall in pressure is often associated with a new fluid level. When the fluid column rises promptly with the application of jugular pressure and falls promptly with release and the same fluid level is maintained, we consider the Queckenstedt test to be normal.

Probably the most important check on the interpretation of the Queckenstedt test is the protein content of the fluid. In no instance in our series did a partial or complete subarachnoid block exist without a very definite increase in the amount of protein. A complete obstruction was usually associated with the Froin syndrome. Incomplete obstruction was often associated with xanthochromic fluid, but the protein content was usually not sufficiently high to cause spontaneous coagu-

4. Fay, Temple: Vasomotor and Pilomotor Manifestations: Their Localizing Value in Tumors and Lesions of the Spinal Cord, Arch. Neurol. & Psychiat. **19**: 31 (Jan.) 1928.

lation. The protein content of the fluid in intradural tumors was consistently higher than in extradural tumors when an equal degree of subarachnoid block existed.

Poppen and Hurxthal [5] have demonstrated experimentally that, as long as an opening remains in the subarachnoid space as large as the bore of the lumbar puncture needle, no change from the normal should be expected in the Queckenstedt test. These observations explain satisfactorily how it is possible for a relatively large tumor to be present with no demonstrable change in the mechanics of the fluid. Certainly, when the patient's symptoms are suggestive of spinal cord tumor, the cerebrospinal fluid dynamics and chemistry are of real importance only when positive.

The other cytologic, serologic and chemical studies of the fluid in our cases were all of relatively little importance in diagnosis. The cell count was uniformly low. The highest count, 26 cells per cubic millimeter, occurred in a case in which there was a rapidly growing intramedullary glioma. The colloidal gold curve usually showed some atypical reduction of the gold chloride in direct proportion to the amount of protein present. The Wassermann tests were negative in all cases.

X-RAY EXAMINATION

The value of x-ray studies of the spinal column without the aid of contrast mediums in localization of spinal cord neoplasms has not been appreciated fully until recent years. It remained for Camp, Adson and Shugrue [6] by studying a large group of verified tumors to demonstrate conclusively the frequency with which bony changes in the vertebrae result from primary tumors of the spinal canal. Many benign tumors arising within the canal, particularly neurofibromas and meningiomas, will show some local deformity in the vertebral pedicles or laminae.

It was impossible to secure sufficient data in our early cases to determine accurately the incidence of such changes. It might be said, however, that in the last twelve meningiomas and neurofibromas eight have shown definite bony changes in the vertebrae.

IODIZED OIL

The use of iodized oil for accurate localization of spinal cord tumors is a most valuable procedure. By some it may be considered an acknowledgment of inadequacy in interpreting neurologic signs, yet from a practical point of view the use of this opaque medium simplifies diagnosis in early cases and saves many laminae during operative procedures. Twenty-two cases (52 per cent) of this series were studied by means of iodized oil. In each instance the lesion was accurately localized. In two cases a tumor was disclosed with iodized oil that was undemonstrable by neurologic examination and cerebrospinal fluid studies. Only fresh iodized oil preserved in glass ampules is fit for use in the spinal canal. When injected in quantities not exceeding 1 cc. we have seen no harmful results that would make us fear its use. By studying the patient carefully with the fluoroscope and taking serial films when necessary, perfect demonstration of filling defects has been accomplished even with this small amount.

Not only is this method valuable in the accurate localization of tumors, but it further justifies its use by clearly differentiating between inflammatory adhesions and tumors of the cord. Widespread inflammatory adhesions over the surface of the cord give poor surgical results, and not infrequently a patient may be spared a needless operation by correct interpretation of the underlying pathologic condition by the use of iodized oil.

TREATMENT

With the exception of malignant tumors of the vertebral bodies, we consider all neoplasms growing within or encroaching on the spinal canal to be surgical problems. Benign tumors arising within the canal can usually be completely removed. In twenty-three cases of this group, total surgical extirpation was possible. A subtotal removal was accomplished in ten cases. In the remaining nine cases there were soft intramedullary tumors and aside from the benefit afforded by the decompression nothing was accomplished surgically. In six instances, however, enough tissue was obtained for histologic study.

The technic of handling benign encapsulated tumors, particularly neurofibromas and meningiomas, is so well standardized that further comment is unnecessary. However, it might be well to reemphasize the fact that the dural attachment of meningiomas should be excised widely or cauterized thoroughly with electrosurgery to insure against recurrence.

In dealing with intramedullary gliomas we have followed a conservative practice. If on exposure of the cord a tumor presents itself on the surface and appears to be reasonably well encapsulated, as is often the case with ependymomas and hemangiomas, a radical dissection is attempted. This is never carried to the point, however, at which gross damage to normal cord substance becomes necessary.

If a fusiform swelling of the cord is demonstrated and no tumor appears on the surface, we explore this swollen area with a small incision through the posterior commissure. Should the tumor be well demarcated it is attacked radically, but when there is no evidence of demarcation no attempt is made to remove even enough for microscopic study, for regardless of the histologic structure of the growth the patient is subjected to intensive irradiation after healing of the surgical wound. Three of the patients in this series have been so treated. The following case history demonstrates graphically what may be accomplished by this conservative method:

D. W., a white girl, aged 18 years, had been bedridden for two months prior to operation. The sensory line was indistinct and studies with iodized oil were necessary to disclose the exact level of the lesion. A fusiform swelling of the cord, extending over approximately two segments, was disclosed. No demarcation between tumor tissue and cord substance could be identified, and the wound was closed without a biopsy. Intensive irradiation with both x-rays and radium extending over a period of sixteen months was employed. Slow, gradual improvement ensued following the first course of treatment. Symptoms regressed and again improved following further irradiation. Many series of x-ray and radium treatments were given, and now nine years later the patient is walking with but little residue of her former paraplegia. The accuracy of the diagnosis may be questioned but it is our belief that the patient had an intramedullary glioma of the cord. It had the gross appearance of a neoplasm. The symptoms disappeared with irradiation only to recur later and again disappear with further therapy.

PROGNOSIS

Three deaths occurred in our group, an operative mortality of 7.14 per cent. One patient died of meningitis secondary to wound infection. This was the only instance in which the wound did not heal primarily. The second patient died five days postoperatively fol-

5. Poppen, J. L., and Hurxthal, L. M.: Normal Cerebrospinal Fluid Dynamics in Spinal Cord Tumor Suspects, J. A. M. A. **103**: 391 (Aug.) 1934.

6. Camp, J. D.; Adson, A. W., and Shugrue, J. J.: Roentgenographic Findings Associated with Tumors of the Spinal Cord Column, Spinal Cord and Associated Tissues, Am. J. Cancer **17**: 348 (Feb.) 1933.

lowing the radical removal of a cervical ependymoma. The third patient died of pneumonia on the seventh postoperative day.

The degree of recovery following the removal of benign spinal cord tumors is remarkable even though there has been advanced disability. It is impossible to predict the probable degree of functional recovery from the appearance of the cord at operation. Some patients with cords of ribbon thinness will show a good return of function, while others with only moderate indentations will experience but little improvement. In general, it may be said that the rapidity with which symptoms develop is a fair index to the probable degree of functional recovery in cases presenting advanced neurologic changes. Those in which paraplegia develops slowly are apt to experience a greater degree of recovery than those in which the onset is more rapid. It is difficult to explain the variation in functional recovery from the appearance of the cord except on the basis of damage to the intrinsic circulation.

Rogers,[1] in attempting to set an index of prognosis, divides his patients into two groups—those that are spastic and those that are flaccid. He considers flaccidity, except in lesions of the cauda equina, to be a very bad prognostic sign. He expects spastic patients in whom the lesion can be completely removed to make a satisfactory recovery. Our experience has been somewhat different with regard to the prognosis of spastic cases. We view with grave concern cases that have progressed to the stage of "massing" of the reflexes. In this stage of paraplegia, we have seen but little functional recovery.

Patients with mild paraplegic signs recover completely within a relatively short time. Many of them will walk out of the hospital in from ten to fourteen days almost free from symptoms. In all cases, regardless of the length of time since the onset of symptoms, some restoration of function may be expected.

Prognosis is difficult in the glioma group. Apparently some ependymomas, even though possessing identical histologic characteristics, respond differently to irradiation. Our data on the response of other gliomas are too inconclusive to justify analysis, but it might be said that one should expect the same type of response to specific gliomas of the cord as would occur with the same type of tumor in the brain.

SUMMARY

1. The clinical, laboratory and x-ray data from forty-two cases of spinal cord tumor treated surgically were studied.

2. The percentage of neoplasms of the spinal cord that are benign is remarkably high, being 56 per cent in this series of cases. These benign lesions can usually be completely removed, but if recovery without disability is to be assured the removal must be accomplished in the early stages of the disease.

3. Spinal cord tumor is a relatively common lesion and should not be the last consideration in a differential diagnosis of spinal cord disease.

4. Careful analysis of symptoms, physical examination, study of the dynamics and chemistry of the spinal fluid, x-ray examination of the spine and studies of the subarachnoid space with iodized oil will in every case disclose the presence and location of the lesion even in the early stages of the disease. The importance of pain as an early symptom of spinal cord tumor has been overemphasized. It was an early symptom in but 50 per cent of our patients, and 26 per cent of them had no pain at any time.

5. Treatment is always surgical except in certain malignant tumors of the vertebrae. Complete removal of benign tumors is usually possible. Gliomas of the cord can occasionally be completely removed, but in most instances one must be satisfied with a subtotal removal followed by intensive irradiation. In certain gliomas even microscopic diagnosis should be dispensed with if biopsy would incur damage to normal cord substance.

6. It is impossible to predict the degree of functional recovery from the appearance of the cord at operation. Some cords of ribbon thinness will show a good return of function, while others with only moderate indentations will show very little recovery. Every patient with some preservation of function below the level of the lesion, even though it is only an isolated reflex, will experience improvement after the removal of the neoplasm.

ABSTRACT OF DISCUSSION

DR. PERCIVAL BAILEY, Chicago: This presentation corresponds closely with my experience. I note the absence of children in the material, so I might supplement the presentation of Drs. Spurling and Mayfield with some remarks concerning these lesions in infancy and childhood. After several years' experience with the material from three large children's clinics, I am impressed with the extreme rarity of intraspinal tumors in infancy and childhood. Whereas, as the authors have pointed out, the ratio between intraspinal and intracranial tumors in adult life is 1:4 or 1:6, in childhood this proportion is much greater, in my experience somewhere around 1:20. Also the pathologic character of the tumors in infancy and childhood is entirely different from that of the adults. The favorable character of these lesions in adults is largely due to the presence of a considerable proportion of meningeal tumors and neurofibromas that are encapsulated and can be totally removed. In childhood and infancy this is not true. The meningiomas and neurofibromas, with the exception of those which are multiple, usually begin to develop about the age of 15. Under that age they are rarely found. The tumors at this age are usually intramedullary gliomas or lipomas or dermoid cysts, which are much less favorable for operation. I have also been impressed in children with the importance of the erosion of the laminae, to which attention was first called by the physicians at the Mayo Clinic. This is much more obvious during infancy and childhood than it is in adult life, probably for the reason that the bones are much softer. I should also like to emphasize what the authors said about the removal of intramedullary tumors. Intramedullary gliomas are predominantly ependymomas, as Dr. Kernohan has pointed out, and these are benign tumors. I had one child, 8 years of age, with an intramedullary ependymoma in the cervical region. The child was having great respiratory difficulty. I made only decompression and split the posterior columns of the cord to make a biopsy. That child is still well and improved after eight years, and he has had no x-ray treatment. In other cases I have made extirpation of these ependymomas. Certainly none of them have done any better than the child in whom I split the posterior columns and let the child alone without even giving him x-ray treatment, so that one may question whether it is necessary to go to any great difficulty in removing one of these ependymomas. I wouldn't make the same statement concerning other types of intramedullary gliomas, which one certainly ought to attempt to remove in many cases, and should certainly irradiate afterward. They are, however, rare.

DR. FRANK R. TEACHENOR, Kansas City, Mo.: Concerning tumors in childhood, I had one several years ago in a child 2 years of age. This tumor was reported by the pathologist as a meningioma. However, the child lived five years and died of pneumonia. There was no autopsy. I cannot discuss the statistical aspect of this paper, as my own statistics are not up to that point; but certainly too much cannot be said for the early diagnosis of spinal cord tumors. It is not uncommon to receive patients who have had gallstones removed. I recently

observed a patient who was operated on and the gallstones were actually found, but the pain did not subside. During the period the patient was in bed recovering from the operation, she developed a paraplegia. Unquestionably the diagnosis of spinal tumor could have been made before the operation. Urethral or renal colic is another very frequent diagnosis. I have seen several cases in which renal and urethral operations were performed without relief, and afterward a spinal cord tumor was found. Those, of course, were the result of compression of the roots with pain phenomenon. Multiple sclerosis should be considered. In many instances multiple sclerosis is considered early, and later symptoms of a spinal tumor become evident. In that instance, of course, pain is not a feature. Concerning the Queckenstedt sign, I find that even in the face of a negative one I am frequently able to locate the tumor by seating the patient before the fluoroscope and watching the progress of iodized oil as it passes down. Even in the absence of a block, it will hang, in a good many instances. I have recently had a rather interesting series of cases, so far as the pathologic condition is concerned, which were not mentioned here. Melanomas, which I consider primary, may be classified under sarcomas. I have recently observed an extradural tumor which had been diagnosed by several pathologists as a lymphadenoma. Thus far, although I haven't searched the literature completely, I have found no mention of lymphadenoma. Another interesting lesion, which caused a marked dilatation of the spinal canal, was a herniation of the arachnoid through a perforation of the sleeve of the dura over one of the roots, with the formation of a very large extradural cyst, apparently of long duration, because of the extensive dilatation of the spinal canal. This was quite evident on radiologic examination. The cyst was removed completely. The pedicle of attachment was found on the dural sleeve of this root. Behind the attachment the spinal cord was encased in normal dura, with a normal subarachnoid space.

ACUTE LARYNGOTRACHEOBRONCHITIS

LIVING PATHOLOGIC CONDITIONS SEEN IN ACUTE RESPIRATORY DISEASES

CHEVALIER JACKSON, M.D.
AND
CHEVALIER L. JACKSON, M.D.
PHILADELPHIA

Our purpose in this paper is to present the differences among certain acute respiratory diseases of children based on the objective appearances of the mucosa of the larynx and the tracheobronchial tree. These appearances represent living pathologic changes. Therefore they are, we venture to think, of the utmost importance to the physician as bearing on the pathologic conditions of the airway which the physician is called on to diagnose and treat in the child battling for his life against these pathologic states. Mention will be made of the clinical features sufficient to associate these appearances with the diseases considered.

NOMENCLATURE

The term "fulminating, acute, infective, nonspecific laryngotracheobronchitis," however descriptive it may be, is certainly not brief nor is it otherwise suitable beyond criticism. The disease is certainly not diphtheritic but it remains to be proved that it is not primarily or secondarily specific. Except as to rash, the malady has almost as much claim to clinical specificity as scarlet fever. "Nondiphtheritic laryngotracheobronchitis" is nearly as bad, and in addition it is a negative title. Influenzal tracheobronchitis, by which the disease has been described,[1] is appropriate in the cases in which the influenza bacillus is found predominating. This constitutes about 5 per cent of our cases, though we have no means of knowing in how many cases this organism may have been the vanished primary invader. Moreover, most of the cases of the disease commonly called influenza and the grip are also primarily or secondarily streptococcic in character.

INCIDENCE AND EPIDEMIOLOGY

It is impossible to supply any exact figures in incidence of acute laryngotracheobronchitis because relatively few of the cases are recognized as a distinct morbid entity. Curiously, the literature shows that, though the existence of such an entity was recognized by at least two keen observers over a century ago,[2] the disease as such in the patient has been quite generally overlooked. The occurrence being chiefly during epidemics of so-called influenza, many of the cases are recorded under that name. Most of the fatal cases are registered in vital statistics as bronchopneumonia and pneumonia. Among these patients some really had bronchopneumonia but only as a secondary development; in almost all instances the primary disease was unrecorded. For this reason statistics are valueless as criteria of incidence.

PATHOLOGY

At autopsy pathologic changes of laryngotracheobronchitis are not as abundantly recorded as are those of diphtheria; but records are accumulating. Autopsies, however, show end results; we have thought it best to limit our presentation to the heretofore unpresented living pathologic changes, the condition with which the physician has to deal in the living patient. The mucosa of the larynx is a deep red, slightly less deep on the cords. The subglottic tissues on each side extend mediad, showing as mounding, intensely red, semielliptic folds, one below each cord.[1a] These swellings are peculiar to children and are due to the loose connective tissue in the conus elasticus in childhood. Small patches of secretion may be seen but they can be wiped away cleanly, leaving no eroded or bleeding surface; there is no ulceration, no membrane comparable to that in diphtheria. The living pathologic condition of the bronchi is interesting and important. The appearances at the progressive stages have been described as follows:[1c] "The tracheal mucosa is reddened. Its color deepens. Swelling of the mucosa begins. Later on exudate forms, at first serous, then mucoid, then purulent and finally thick, tenacious and exceedingly difficult of expectoration even by the robust adult. In infants

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Owing to lack of space, this article has been abbreviated in THE JOURNAL. The complete article, including a color plate, will appear in the reprints, a copy of which may be obtained from the authors.

1. These references include:
(*a*) Jackson, Chevalier: The Bronchoscope as an Aid to General Diagnosis, April 1908 (color plate showing bronchoscopic view of influenzal tracheobronchitis).
(*b*) Jackson, Chevalier: Influenzal Tracheitis, editorial Laryngoscope **22**: 130-135 (Jan.-Dec.) 1912; Drowning of the Patient in His Own Secretions, ibid. **21**: 1183-1185 (Dec.) 1911.
(*c*) Jackson, Chevalier: Influenzal Tracheitis, Peroral Endoscopy and Laryngeal Surgery, St. Louis, Laryngoscope, 1915, pp. 480-482; Tracheite grippale: Endoscopie et chirurgie du larynx, Paris, Gaston Doin, 1920, pp. 509-511.
(*d*) Jackson, Chevalier, and Jackson, C. L.: Inflammatory Edema of the Larynx, Surgery of the Larynx, Trachea and Bronchi, in Lewis, Dean: Practice of Surgery, Hagerstown, Md., W. F. Prior Company **4**: 15-39 (chapter 7) 1930.
(*e*) Jackson, Chevalier, and Jackson, C. L.: Acute Infective Laryngotracheitis: The Nose, Throat and Ear and Their Diseases, edited by Chevalier Jackson and George M. Coates, Philadelphia, W. B. Saunders Company, 1929, pp. 1118-1121.
(*f*) Jackson, Chevalier, and Jackson, C. L.: Acute Laryngotracheobronchitis: Bronchoscopy, Esophagoscopy and Gastroscopy, ed. 3, Philadelphia, W. B. Saunders Company, 1934, pp. 311-312.
(*g*) Jackson, Chevalier: Croupy Cough and Dyspnea Simulating Diphtheria Due to Infective Laryngotracheobronchitis, M. Clin. North America **5**: 648 (Nov.) 1921 (color plate).

2. Blaud, P.: Nouvelles recherches sur la laryngo-trachéite connue sous le nom de croup, Paris, 1825. Trousseau, Armand: Nouvelles recherches sur la trachéotomie pratiquée dans la période extrême du croup, Paris, 1851.

who are naturally almost incapable of expectoration, death may occur from inability to rid the air passages of secretion (drowning of the patient in his own secretions). The bronchi, or even the trachea itself may be occluded by mucosal swelling, or edema, actually causing death by the stenosis. Both these conditions are independent of bronchopneumonia, which may or may not exist." Subsequent observations have fully confirmed these observations. As in other conditions the rings, so characteristic of the normal, are obliterated by swelling. Some orifices are noted as filled with pus, and absence of bubbling indicates no passage of air. Still other orifices are found obstructed with straw-colored or brownish crusts. These crusts have the appearance of dried serum with little admixture of pus. It is true that thick pus too viscid to run down the glass walls of the collector is seen in various bronchial diseases,[5] but no such dry gumlike and crusted secretion as that previously described is ordinarily seen in any disease other than the malady under consideration. In rare instances an outstanding feature of the endobronchial picture is the dry, sometimes even glazed, appearance of the tracheobronchial mucosa.

Laryngeal and Bronchoscopic Appearances of Diphtheria.—By means of direct laryngoscopy in children one sees at first an intense inflammation of the laryngeal mucosa, and even in the early stages it is noted that the subglottic tissues swell out so as to approach each other, looking, as protruded from each side below the cords, somewhat like the turbinal bodies in the nose. The membrane may come on any part of the larynx or on the subglottic swelling. Sometimes the membrane does not appear in either the fauces or the larynx. We have seen many such cases. The patients are always quite dyspneic and ashy in color. On putting down a

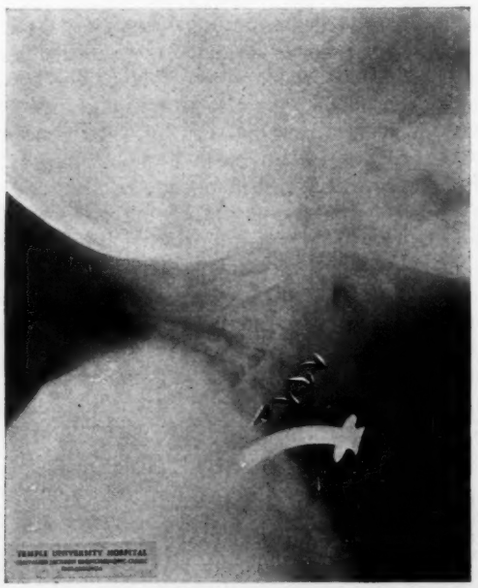

Fig. 1.—Roentgenogram showing obliteration of the tracheal lumen, complete at the point *A*, by mucosal swelling complicating streptococcic laryngotracheobronchitis in a child aged 15 months. Recovery followed repeated bronchoscopic removal of plugs and crusts of tough, gummy, adherent secretion that produced atelectasis and impending asphyxia (compare figures 2 and 3).

bronchoscope, one finds obstructive exudate in the trachea or in either or both bronchial orifices. In most of these cases by the time the bronchoscopist is asked to make his examination the child is extremely dyspneic. Therefore no attempt should be made to examine the larynx without proper preparation for a bronchoscopy, including bronchoscopic forceps that can be used to remove the obstructive exudate in case it is encountered. Many, many times we have saved a child from asphyxia by removing great masses of membrane with the bronchoscopic forceps. Early in the disease the membrane is tightly adherent and leaves a bleeding surface if it is pulled off. The children, however, are seldom seen in this stage; usually, when the bronchoscopist is called the membrane is being shed and there may be obstructive, cast-off membrane. Before this stage of shedding the membrane may look like edematous polyps in the nose, and whitish grapelike masses may be drawn up through the bronchoscope with the forceps, causing a sucking sound as they come through. When these appearances are encountered by the experienced observer there can be no question about the diagnosis. There are membranous and exudative forms of laryngitis and tracheitis, but none are accompanied by exactly the clinical picture here described.

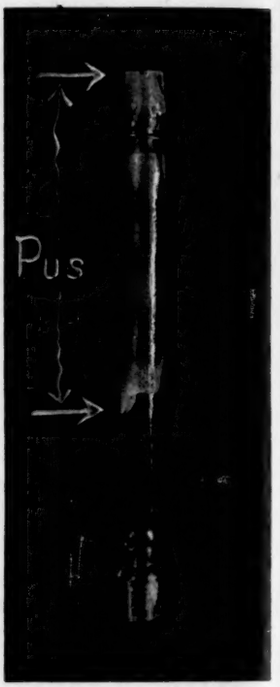

Fig. 2.—A collecting tube showing pus aspirated from the bronchi of a baby, aged 15 months, very ill with streptococcic laryngotracheobronchitis. Aspirations with a catheter through the tracheotomic cannula by the nurse were necessary at frequent intervals. Many times the aspirations brought the child back to life from a seemingly moribund condition. Each time the partial atelectasis at both bases, simulating pneumonia, completely cleared. The obstructive character of the pus is obvious from the fact that it was so thick and tenacious it would not run down the inverted glass collecting tube. All together about fifty of these tubes were used. Additionally, plugs and crusts were formed of this secretion (compare figure 3).

Laryngoscopic and Bronchoscopic Appearances in Laryngismus Stridulus.—In almost half the cases of acute laryngotracheobronchitis that we have seen the primary diagnosis of "spasmodic croup" had been made on an inferential basis. No one could ever make such a mistake by direct examination. It therefore seems proper to describe the laryngoscopic appearances in laryngismus stridulus. In most cases of laryngismus stridulus in children examined during the attack the mucosa is found to be lavender or violet but otherwise normal. In severe cases there is not only a glottic spasm but a laryngeal sphincteric closure. In these cases the cords are hidden by the closure of the ventricular bands; the aryepiglottic folds are crowded over in support of the bands. In most cases the glottic closure will relax and the child draw a deep breath. It will then be seen that, except for the lavender, violet or grayish color of the mucosa, the larynx is normal. If the sphincteric closure does not promptly relax, allowing the patient to take a deep breath, the proper thing to do is to introduce gently a small bronchoscope and then start the child's breathing, if it has already stopped, by insufflation of oxygen plus carbon dioxide, 5 per cent, combined with artificial respiratory movements. After respiration is fully established and going on rhythmically, the bronchoscope can be removed. It will then be seen that the glottis will abduct widely on

5. Jackson, Chevalier, and Jackson, C. L.: Peroral Pulmonary Drainage, Natural and Therapeutic, with Special Reference to the Tussive Squeeze, Am. J. M. Sc. **186**: 849 (Dec.) 1933.

inspiration, especially the deep inspiration that the child will take because of the air hunger and the stimulus of the accumulated carbon dioxide on the respiratory centers. Thereafter, for a time at least, breathing will go on regularly with the laryngoscope in place but with the bronchoscope removed. Any one accustomed to examine the larynx without anesthesia will promptly recognize the abnormal sphincteric closure and the discolored but never red mucosa as in strong contrast to the deep fiery red that is present in both diphtheria and laryngotracheobronchitis. The difference between the latter two conditions has already been given. If the patient is examined a few hours after a croupy attack, the contrast between laryngismus stridulus on the one hand and the two diseases mentioned on the other is still more striking. The mucosa of the larynx and trachea will be found perfectly normal, but there is usually an abnormal flaccidity of the margins of the laryngeal orifice that is unmistakably typical.

It might be added here that our opinion is that in laryngismus stridulus the exciting cause of the attack is the sudden violent inspiration started by the entrance of secretions into the larynx. The nerve paths traveled are phylogenically very old; they are concerned with the sphincteric closure of the airway against the entrance of anything other than air. To this primary closure is added the secondary passive closure due to indrawing of an anatomically flaccid, usually rachitic, laryngeal orifice. It is this pathologic flaccidity that explains why relatively few children are affected to the degree noted in laryngismus stridulus. Mouth breathers are especially prone, because swallowing is almost impossible with an open mouth; hence secretions accumulate in the laryngopharynx and overflow into the larynx. This happens with any mouth breather, but lacking the rachitic, flabby, laryngeal orificial tissues the reaction is merely a partial awakening, a choking and a clearing away of the intrusive laryngeal secretions.

CLINICAL FEATURES

The symptomatology and almost all the clinical features of acute laryngotracheobronchitis are the same as those of laryngotracheobronchial diphtheria before the days of antitoxin. The chief differences today arise from the fact that we have no remedy for streptococcic infections that is in any degree comparable to diphtheritic antitoxin; the disease must run its course, usually long, and we are fortunate if we can keep the patient alive until the course is run. Space limits here forbid detailed reports of cases. The important clinical features were described by Chevalier Jackson [1b] and illustrated by two typical cases, one an influenzal infection with recovery, the other streptococcic and fatal. A typical case may be cited here:

A typical case of streptococcic laryngotracheobronchitis with a misleading history and a favorable termination. A boy, aged 15 months, two days before admission fell and struck his head. Cold compresses were applied. The mother stated that "his nose started to run as if he had a cold in the head." That night the breathing became "heavy," and a cough started and soon became "croupy." The mother stated that the child had been playing with dried beans. Two unassociated physicians in succession prescribed medication, but the breathing became more and more labored and Dr. Ralph Tyson was called. He made a diagnosis of laryngotracheobronchitis and advised direct laryngoscopic examination, for which the child was brought to Temple University Hospital. On admission the temperature was 104 F., respirations 30, pulse 110. There was marked indrawing at the suprasternal notch and the epigastrium. The condition was toxic. The color was slightly cyanotic, especially the fingers and toes. Dr. Ralph Tyson found dulness throughout the chest most marked posteriorly and laterally. Coarse râles were heard all over on both sides. An oxygen tent with humidifier gave temporary improvement but asphyxia impended. Preparations were made for tracheotomy to relieve the obvious obstructive laryngeal dyspnea and for a bronchoscope to be inserted to maintain the airway during the tracheotomy. Direct laryngoscopy revealed cords fixed in the position of partial approximation. Immediately below the cords the lumen was just about obliterated by reddish swellings that met in the midline. A mucopurulent secretion was seen in the larynx and in the subglottic region. A 4 mm. bronchoscope was inserted and a quantity of thick tenacious pus was aspirated. The relief of the dyspnea was immediate and the child became tranquil. The bronchoscope was held in situ to maintain an airway while a low tracheotomy was done. For four or five hours the condition of the patient was very satisfactory under catheter aspirations by the nurse; then he grew rapidly worse. The temperature was not high but the respiratory and cardiac rates rose rapidly. The breath sounds disappeared at the bases and the percussion note became dull. Bronchoscopy and the removal of plugs of thick secretion restored the patient to a very satisfactory condition. A few hours later the recurrence of symptoms and signs of obstructive secretions again required bronchoscopic removal. This cycle was repeated many times before the bronchial inflammation subsided and the mucosa and secretions became normal. The Proetz treatment was given the nose. Bacteriologic reports at first were Micrococcus catarrhalis; later Streptococcus haemolyticus. Medical care and management were directed by the pediatrician Dr. Ralph Tyson. Decannulation and perfect recovery followed in due course.

Fig. 3.—Specimens of plugs and crusts of inspissated secretion bronchoscopically removed from orifices of bronchi, where they were causing recurrent attacks of obstructive atelectasis simulating pneumonia in a child aged 15 months. These crusts were composed of bloody serum and the pus referred to in the legend to figure 2.

The foregoing case is not unusual in the misleading character of the preliminary history, and it is typical of a streptococcic laryngotracheobronchitis running a favorable course under treatment.

CONCLUSIONS

1. Acute laryngotracheobronchitis is a clinical type. It occurs most often and most severely during epidemics of so-called influenza. In from 3 to 5 per cent of the cases the influenza bacillus seems to be causative; occasionally other organisms seem responsible; but over 90 per cent of the cases are primarily or secondarily streptococcic. The mortality in children under three years is about 70 per cent.

2. In laryngismus stridulus, observations of the living pathologic condition show that the mucosa is lavender, violet or grayish but is otherwise normal and that the discoloration quickly disappears, when the airway is laryngoscopically held open, without leaving a trace of abnormality. It is suggested that attacks may be

due to inspiration of pharyngeal secretions during sleep. The consequent sudden and violent efforts to draw in air draw in the laryngeal orifice in a sphincteric closure. The nerve paths followed are phylogenically very old.

3. In diphtheria limited to the larynx and tracheobronchial tree there is a fibrinous exudate that objectively is very different from the inflammatory exudate seen in streptococcic infection of the same mucosal areas.

4. In acute laryngotracheobronchitis the outstanding feature of the bronchoscopically observed pathologic condition is the bronchial obstruction by inspissated secretion which the weak or absent cough reflex is unable to expel. Therefore the following points are important in the treatment of this disease:

(*a*) The routine administration of atropine and opium derivatives is illogical in theory and often fatal in practice.

(*b*) The superheating of the air in our hospitals and dwellings contributes largely to inspissation of secretions. Outside air at zero contains little water even at the dew point. When we heat this air to 70 F. it becomes extremely desiccating to the secretions and almost caustic to the mucosa. The air surrounding the patient with laryngotracheobronchitis with inspissating secretions should be humid to saturation.

(*c*) In this disease an impaired percussion note and increased respiratory rate usually mean not pneumonia or bronchopneumonia but obstructive atelectasis.

(*d*) These signs call for peroral or tracheotomic aspiration of secretions. In extreme cases forceps removal of crusts is the only means of saving life. Such potentially fatal circumstances can be prevented by humid air and the avoidance of atropine, opiates and other desiccating medicaments.

5. In the treatment of babies one must remember that, relatively, a cat in the laboratory has nine lives, a dog has about three, but a baby in his crib has only one. It is a paramount duty of the pediatrician and the family physician to see that the baby gets intervals of rest and that such rest is not interfered with by too many examinations, by serum reactions, by torturing urticaria and by subdermal abscesses. This is not a criticism of scientific medicine but a reminder to the clinicians that they are the balance wheels of the therapeutic machinery.

3432 North Broad Street.

ABSTRACT OF DISCUSSION

DR. JOSEPH BRENNEMANN, Chicago: I hope that "streptococcic bronchitis" will not replace the term in common usage, laryngotracheobronchitis. The latter is descriptive and both clinically and pathologically adequate; the former is based on etiology and may call for recantation later. The Jacksons have said that "the essential problem is that of the pediatrician and the general practitioner." One can only agree with that statement if it is meant to point out the great importance of early recognition of the nature and gravity of the disease. The one important person is the bronchoscopist; the one important thing to do is to keep the airways clear so that the child will not die of atelectasis due to obstruction by the characteristically thick, tenacious secretions. Compensatory emphysema doubtless also enters into the picture, when no longer adequately compensatory. The all important measures to keep the airways clear are bronchoscopic aspiration, as often as necessary, and tracheotomy. The latter both relieves the subglottic obstruction and facilitates the removal of secretions through a catheter and negative pressure apparatus or through the bronchoscope itself. Intubation seems contraindcated. It frequently does not relieve the laryngeal obstruction and does not function in removing the all important secretions. Contrary to the situation in laryngeal diphtheria, the disease often lasts a long time and requires long retention and usually frequent reintroduction of the intubation tube. A child is now at the hospital who was intubated some fifty times elsewhere, who has a contracted larynx, no voice, a tracheotomy tube in place for months that may remain indefinitely. Bronchopneumonia may follow tracheotomy but it is the lesser hazard. Doubtless too, as Chevalier Jackson pointed out years ago, in laryngeal diphtheria what is thought to be pneumonia is more often bronchial obstruction, in diphtheria due to membrane, here to thick secretions. I heartily agree to what has been said about atropine or belladonna. I am tempted to say the same of nearly all cough medicines that impair the tussive reflex and, while helping the parents, harm the child. In former experience nearly all of these children, usually infants, died. Recently most of them have lived because a bronchoscopist, trained by the Jacksons, who devotes all his time to endoscopy is readily accessible—one of the greatest comforts of my professional life. Parenthetically, not one twentieth of the endoscopist's work has to do with foreign bodies in the usual sense.

DR. CLIFFORD G. GRULEE, Evanston, Ill.: This meeting has lost something in not having seen the original paper, as I have, for there were several statements in it that were very interesting. One of the characteristics of the paper that struck me was the vagueness of the definition of the condition. I am not sure I know just exactly what they are talking about. Apparently Dr. Brennemann does. If they are talking about spasmodic croup, that is one thing. If they are talking about a streptococcic involvement of the trachea, larynx and bronchi, that is another. That wasn't very clear in the original paper. The streptococcic infections have been known for a good many years. The inspissation of the mucus and the secretions have been recognized. The one thing that should be done that has not been stressed sufficiently, which would prevent a great many bronchoscopic examinations and the necessity for them, is that the child should immediately be put in a steam tent and kept there. When I say "a steam tent" I mean a steam tent. I mean that the steam shall be very thick and shall be kept up without any interruption over hours. In many instances, if I know the condition about which we are talking, the steam tent does get results. I am not at all sure that I can agree with the authors or with Dr. Brennemann as to the danger of using atropine or belladonna in these cases. For the last twenty years I have used atropine and belladonna and steam in all my cases of respiratory infections of almost every sort except lobar pneumonia. I feel the results have been very good and I think that some of these can be attributed to the action of the atropine. On the other hand, I think we owe to Dr. Chevalier Jackson and Dr. Chevalier Jackson Jr. a great debt for bringing to our attention two things: first, the pathology of this condition as seen in the bronchoscope and, second, the fact that so much of the disturbance is on the basis of the inspissated secretions.

DR. ISAAC A. ABT, Chicago: When a baby with laryngeal stenosis is seen in the home or brought to the clinic, he needs immediate attention. Often it is difficult to classify at once the bacteriologic nature of the laryngotracheobronchitis. The Jacksons have already pointed out that the condition in question may be due to any one of a number of organisms. I am inclined to agree with Dr. Brennemann that the designation of streptococcic laryngotracheobronchitis may be too inclusive. While it is true that diphtheritic laryngitis is not as frequent at present as in former times, nevertheless it must be borne in mind. In the earlier years laryngeal stenosis due to diphtheritic invasion of the larynx seemed to occur more frequently than the variety of laryngotracheobronchitis that the Jacksons have just described. Cultures were always made and the pharynx was inspected carefully, though immediate relief of the stenosis was indicated then as now. A great deal was said about intubation for relief of laryngeal stenosis. Indeed, the introduction of the tube was a fine art, though there are few intubations being performed nowadays and the laryngologists have favored tracheotomy. These children come into the hospital as emergency cases. They are extremely dyspneic and desperately ill. The indication is for immediate relief. The vogue today is to

use the Mosher tracheocannula or so-called life saver. Intubation would probably be an equally efficient and safe procedure and in some instances might tide the patient over until the edema and inflammation had subsided and the air passages had resumed a nearly normal function. It is true that intubation might not succeed in every case and a subsequent tracheotomy would have to be performed, though on the other hand if the intubation tube is introduced skilfully no harm would be done. With reference to blood transfusion in these cases, I must admit I am somewhat skeptical as to its indication. My impression is that these patients do not need blood. What they need is air. I realize that blood transfusion is widely used, and in moderately severe cases no treatment is complete without one or more transfusions. Nevertheless, one should meet the immediate indication and not supply blood when air is urgently needed. I would hesitate to place these strangling children in a steam tent. The amount of oxygen in these tents is limited. The exhaled air will sooner or later reduce the volume of available oxygen. If one wishes to supply moisture, I think it would be better to increase the humidity of the whole room. This can be done by moistening large turkish towels and suspending them about the room, so that the air is saturated to the dew point. In this way perhaps some of the gummy inspissated matter may be liquefied and expectorated.

DR. RALPH M. TYSON, Philadelphia: It has been my privilege to work with the Jacksons in a number of these cases. Cultures taken from the larynx and trachea showed that they are not diphtheritic. We have found the streptococcus and in one case the hemolytic Staphylococcus aureus as the infecting organism. Another point I want to emphasize is the value of oxygen plus the moisture. A machine can be arranged whereby the two can be obtained at the same time. I must disagree with Dr. Grulee with regard to the use of atropine or belladonna. It has been our experience that the drug is a dangerous one to use in these cases. The question also comes up as to just how one is going to procure rest for these children. The use of opiates has been tried and we have just about abandoned the use of either paregoric or codeine. I want to make it clear that we do not use transfusions during the acute stage. It must be remembered that these children have gone through a serious infection that is not over in a day or two and often lasts weeks and sometimes months. It is then, of course, that we use the transfusions.

DR. CHEVALIER L. JACKSON, Philadelphia: Dr. Tyson has almost closed the discussion for me, but there are one or two things on which I should like to comment. I was glad that Dr. Brennemann emphasized so convincingly the importance of proper postoperative care of the tracheotomic patient. Too often physicians and surgeons feel that the battle is won when a child has a tracheotomy tube in his trachea. Too often, twenty-four to forty-eight hours later, the child dies because of inadequate postoperative care. Crusts form in the trachea, or swelling of the tissues lifts the lower end of the tube out of the trachea; one of many, many things may happen. A cannula may be absolutely clear of any obstruction; after autopsy it is reported that the trachea and the tracheotomic cannula were found entirely clear—but were the main bronchi clear? That is equally important. We have heard enough about atropine and opiates from the pediatricians. While that subject was discussed at length in part of the paper, that part was not read. I will let Dr. Tyson's discussion of that phase of the question stand without further comment. To avoid confusing the issue, since we are primarily discussing acute infective laryngotracheitis, I have limited myself to presenting here only the portions of the paper which deal directly with this condition. In the full paper as prepared for publication, we attempted to describe the endoscopic appearance of the larynx and tracheobronchial tree in acute infective conditions such as acute laryngotracheitis and diphtheria, as well as that in certain other conditions. As to the steam tent, I think Dr. Abt makes an excellent point in suggesting that we use a "steam room" rather than a steam tent, because in a steam tent too often there is heat. Heat, we think, is bad for these little patients. A steam room, or the oxygen tent with cool, humidified oxygen is our preference in the Temple Clinic at the present time.

COMMON TUMORS OF THE EYELIDS

C. S. O'BRIEN, M.D.
AND
A. E. BRALEY, M.D.
IOWA CITY

Tumors of the eyelids are quite common, most of them, excluding chalazia, arising from the skin and its appendages. The greater number of such growths are benign but some are malignant.

In order to determine the types of common lid tumors and the relative frequency of each type, and in an attempt to establish more accurate clinical diagnoses, clinical and pathologic studies were made in a series of 100 consecutive cases.

Pathologically these 100 tumors were classified as follows: papillomas 34, nevi 17, carcinomas, 15, sebaceous cysts 13, fibromas 5, sudoriferous cysts 4, hemangiomas 4, dermoid cysts 2, molluscum contagiosum 2, malignant melanoma 1, sweat gland adenoma 1, xanthelasma 1, granuloma 1.

Papilloma (cutaneous wart).—A benign neoplasm characterized by a localized overgrowth of epithelium and the underlying connective tissue. It is apparently the most common tumor of the lids. Such growths were found in middle aged or elderly persons, were usually single but occasionally multiple and, although most frequently located at the margin of the lid, also appeared in other parts of the lid. Growth was slow; in most cases there had been no noticeable increase in size over a period of years. Typical papillomas were small, fairly firm and pedunculated and had nodular warty surfaces; they were not unduly pigmented, and consequently they were of approximately the same color and shade or only slightly darker than the surrounding skin. The most typical characteristics of papillomas were the pedunculation and the papillated surface, but occasionally the tumor arose from a broad base and its surface was smooth or only a bit uneven, and in such cases it was difficult or impossible to differentiate clinically from a nevus or fibroma or even an early epithelioma. Ulceration of the surface was noted in only one case.

Under the microscope papillomas appeared to be formed by an overgrowth of epithelium and proliferation of the underlying connective tissue. The epidermis was thickened and large papillae were formed. The basal cells of the epidermis contained small amounts of pigment here and there and many mitotic figures, while the superficial cells showed excessive keratinization. Underlying the thickened epithelium and extending into the papillae was a variable amount of more or less dense, vascularized connective tissue stroma, which invariably showed perivascular and subepithelial infiltrates composed of lymphocytes. In one tumor the infiltrates were composed of lymphocytes and polymorphonuclear leukocytes.

Nevus.—A congenital benign tumor characterized by a peculiar type of cell believed to arise from the end-apparatus of the cutaneous sensory nerves. Several nevi were seen, and it is apparently a common tumor. They usually occurred singly and often were located at the margin of the lid. According to the histories the nevi, with one exception, grew slowly or remained

From the Department of Ophthalmology, State University of Iowa College of Medicine.

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stationary over a period of years. Typical nevi were small to medium size, firm, sessile growths, having smooth, delicately pigmented surfaces. This appearance varied and often it was difficult to differentiate a nevus from a papilloma, fibroma or early epithelioma; for example, two of the nevi were pedunculated, one

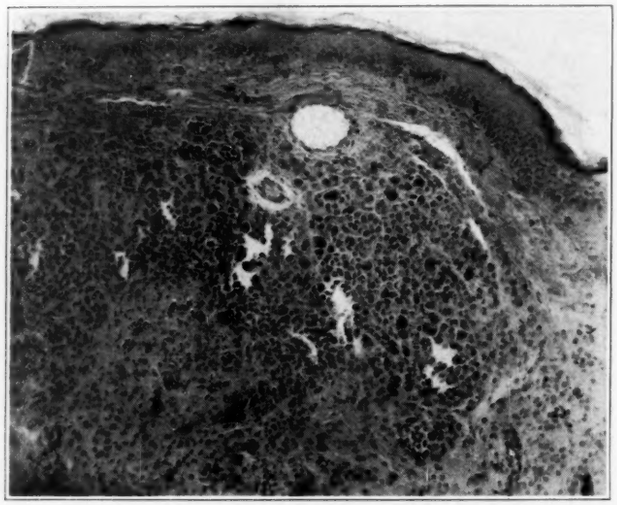


Fig. 1.—Nevus.

was translucent, one was soft, in several no pigment was seen and in two the surface was nodular or papillated. Pigmentation was never dense; consequently it was not considered characteristic.

The origin of nevi remains unsettled; they have been described as arising from the basal cells of the epithelium, from the endothelium of the blood vessels, from chromatophores and from the end-apparatus of the cutaneous sensory nerves. At present the tendency is to accept the last of the aforementioned theories; i. e., Pierre Masson's theory of derivation from the cutaneous sensory nerve end-apparatus. Microscopic

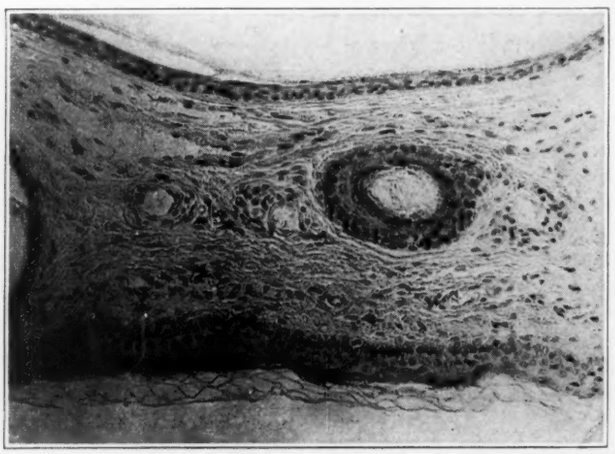


Fig. 2.—Wall of sebaceous cyst.

studies revealed two types of cells, the nonpigmented nevus cells and the pigmented melanoblasts. The tumors were composed of nests, whorls or cords of nonpigmented, closely packed nevus cells lying in the dermis. The epithelium was usually normal but occasionally showed some downgrowth in isolated areas. The nevus cells were round or polyhedral and had large nuclei. Many multinucleated or giant nevus cells were seen. A few fusiform pigmented cells, known as melanoblasts, were present in and around the margin of the nevus cell groups. The stroma was composed of more or less dense connective tissue, which interlaced between the nevus cell nests but did not extend between individual cells. Blood vessels were scanty as a rule. With one exception these tumors were evidently quiescent and no mitotic figures were found in the nevus cells.

Carcinoma.—A malignant epithelial neoplasm characterized by proliferation and downgrowth of epithelium, with invasion through the lymph channels and destruction of the surrounding tissues. There are two types of skin carcinoma: the basal cell carcinoma or rodent ulcer, a relatively benign growth, which is common in the eyelids, and the more malignant epidermoid carcinoma or acanthoma, which is not so common about the eye. Both types grow slowly and are locally malignant in that they invade and destroy the neighboring tissues, but only the epidermoid carcinoma metastasizes to distant organs.

As is usual, all such tumors in this series occurred in persons beyond 40 years of age. Thirteen of the fifteen cases were rodent ulcers and two were epi-

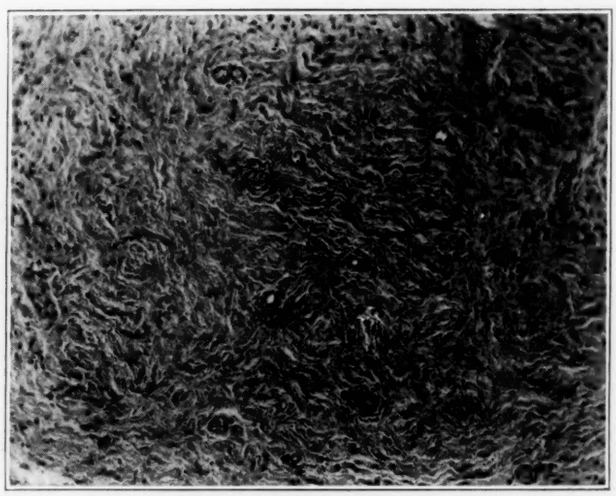


Fig. 3.—Neurofibroma.

dermoid carcinomas. A clinical differentiation between the two types was not possible in the tumors here reported, since locally they have much the same appearance and no distant metastases were evident. Several of the neoplasms were located near the medial canthus, a favorite site for rodent ulcer; however, others appeared in other parts of the lids. All were more or less elevated and had the characteristic indurated, rolled, nodular margins. Four of the early smaller tumors had not yet ulcerated but in each the surface showed a central depression; the others presented a central, depressed, ulcerating, granulating surface covered with crusts.

The rodent ulcers, under the microscope, were composed of columns and irregular masses of deep blue staining cells which extended downward and infiltrated into the dermis and subcutaneous tissues. These cells resembled the basal layers of the epithelium but, as a rule, were somewhat smaller; they were small, spindle or polyhedral cells with large nuclei and a scanty cytoplasm. Here and there cystic spaces gave evidence of degenerative changes in the tumors. A moderate number of mitotic figures were present. Prickle cells.

evidences of keratinization and epithelial pearls were absent. A fibrous tissue stroma, infiltrated in many places with lymphocytes and plasma cells, occupied the areas between masses and columns of epithelial cells. Erosion and ulceration of the surface were present in most of the tumors.

The epidermoid carcinomas were characterized by downgrowths of stratified squamous epithelium, composed in great part of cells of the prickle cell type, with intercellular fibrils and areas of keratinization within the tumor, which gave rise to the typical epithelial pearls characteristic of this type of neoplasm. In the connective tissue stroma were areas of lymphocytic and plasma cell infiltration. Erosion and ulceration of the surface were present in both tumors.

Sebaceous Cyst.—A cystic tumor of the skin arising from a sebaceous gland. Typical cysts arose from a broad base and appeared as yellowish white, rather firm, elevated nodules with smooth, nonpigmented surfaces. Some were located in the region of the cilia at the margin of the lid, while others occurred in other parts of the lid. These cysts were sometimes difficult to differentiate clinically from fibroma or xanthelasma.

The cysts were lined with stratified squamous epithelium and contained a material which appeared to be made up of degenerated epithelial cells and fatty debris.

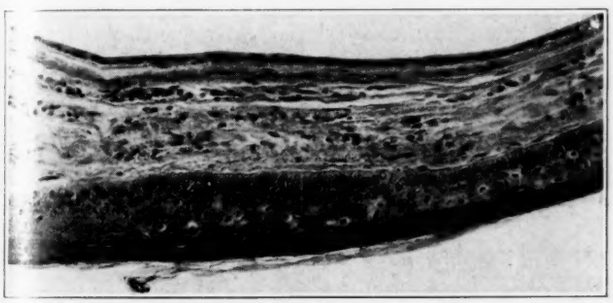


Fig. 4.—Wall of sudoriferous cyst.

Sudoriferous Cyst.—A cystic tumor of the skin arising from a sudoriferous gland. Such cysts appeared as translucent, yellowish brown nodules; they arose from broad bases and i variably had smooth surfaces. These tumors transmitted light, a property which served as an infallible differential diagnostic sign.

The cyst lining of low cuboidal epithelium enclosed an optically empty cavity.

Hemangioma.—A congenital benign tumor composed of an overgrowth of newly formed blood vessels. There are several types of angioma, three of which were encountered in this series of cases.

Two typical cases of plexiform angioma were seen in infants. In one the tumor had been visible three weeks, appearing as a small, dark red spot on one lower eyelid. It had grown rapidly and, on admission, appeared as a dark red, bleeding, ulcerating, granulating nodule approximately 6 mm. in diameter. It was attached to the skin by a broad pedicle. The clinical diagnosis lay between angioma and granuloma. The tumor in the other child was larger and was located in the upper lid and forehead; it had the typical dark red appearance. Structurally the tumors were composed of masses of newly formed capillaries or, rather, small endothelial tubes, some of which were apparently solid. An enormous number of mitoses were present. In one tumor the surface epithelium had ulcerated and the underlying vascular tissue was infiltrated with leukocytes.

In a man, aged 53, with nevus vinosus or so-called port wine stain, there were two small, slightly elevated, dark red tumors in the lower lid, which had not

Fig. 5.—Hemangioma; nevus vinosus or port wine stain.

increased in size since infancy. Under the microscope the tumor was seen to be composed of many dilated capillaries situated directly beneath the normal epidermis. As was expected in a stationary tumor, no mitoses were found.

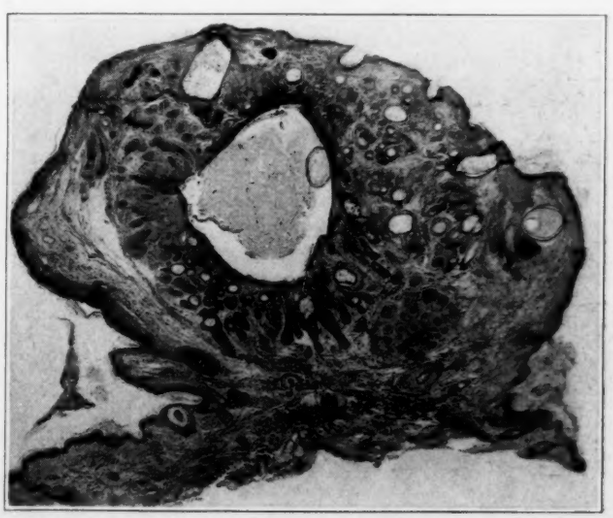


Fig. 6.—Dermoid cyst, multilocular.

One small cavernous angioma of the skin was seen in a woman aged 20. There were several, deep purplish red, slightly elevated tumors along the margin of one lower lid which, according to the patient's statement, had been present since birth. Microscopically, the epidermis was normal but the underlying dermis and subcutaneous tissues were occupied by large, thin walled, vascular channels.

Fibroma.—A benign tumor composed of connective tissue which is believed to originate in the sheaths or connective tissue elements of peripheral nerves. All five fibromas were located at or near the margin of the lid. They were yellowish white, firm, elevated nodules with smooth surfaces and arose from broad bases.

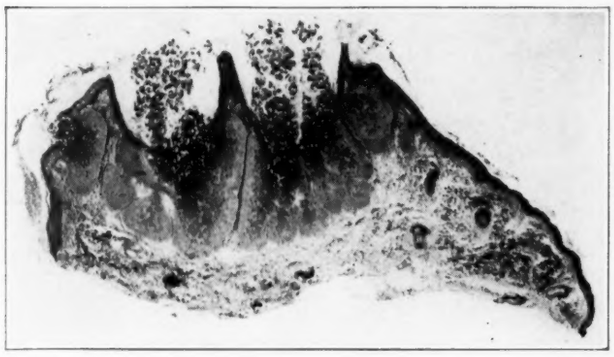


Fig. 7.—Molluscum contagiosum.

Some were difficult to differentiate clinically from nevi, sebaceous cysts or early epitheliomas. In the one case of neurofibromatosis multiplex (von Recklinghausen's disease) the nodule was located in the subcutaneous tissue of the lower lid; it was soft and the overlying skin appeared unchanged.

Microscopically the fibromas were composed of masses of dense, more or less avascular connective tissue and collagenous fibers arranged in whorls and cords beneath the epidermis. The neurofibroma was similar in appearance but much more cellular and quite vascular; a few medullated nerves were visible in sections stained according to Held's method.

Dermoid Cyst.—A congenital cystic tumor formed by an inclusion of dermal tissue along the line of an embryonic fissure. Such cysts may be extremely simple, having a lining of simple stratified squamous epithelium but no glands or hair follicles, and are then classified by Ewing and others as epidermoid cysts. More often

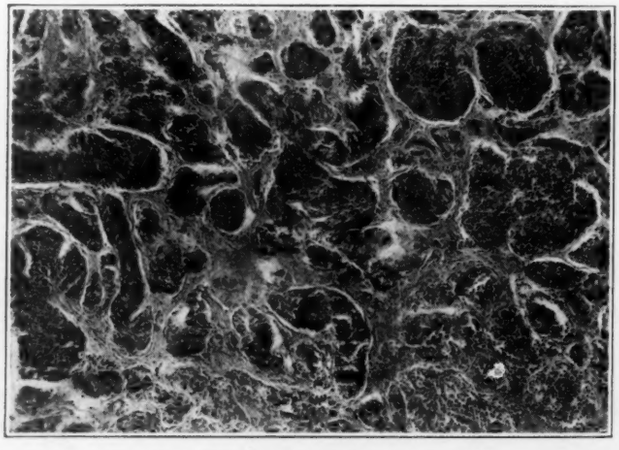


Fig. 8.—Malignant melanoma.

dermoid cysts are more complex and contain all the elements of the skin; for example, epidermis, dermis, dermal glands, and hair follicles and even, on rare occasions, lymphoid tissue, muscle, bone and other tissues.

Two dermoid cysts, both of which had been present since birth, were seen. One tumor, an epidermoid cyst, appeared as a hemispherical nodule, approximately 6 mm. in diameter, located at the medial edge of the upper lid just above the canthus. The skin appeared normal and was movable over the tumor. Microscopic examination showed the tumor to be lined with a thin layer of stratified squamous epithelium, but hair follicles and glands were not found. The tumor looked much like a sebaceous cyst but was believed to be a simple dermoid on account of its presence at birth and its location in the region of an embryonal fissure. The other, a more complex cyst, was a pedunculated growth approximately 5 mm. in diameter, located lateral to the external canthus. Its color was similar to that of the skin, to which it seemed to be attached, and its surface was slightly nodular. It might easily have been confused with papilloma on account of its nodular surface and pedunculation. Under the microscope this tumor proved to be a multilocular dermoid cyst. The overlying epidermis showed some large papillae. In the underlying dermis and subcutaneous tissue were one large cyst and several small daughter cysts, each lined with stratified squamous epithelium surrounded by many hair follicles, some of which opened into the cysts. The cysts appeared to be filled with sebaceous material and other débris. An interlacing connective tissue stroma lay in the area between the cysts.

Molluscum Contagiosum.—A contagious disease of the epidermis caused by infection with a specific filtrable virus and characterized by the formation of small nodules in the skin. Two such cases were seen. One occurred in a child showing three nodules on the face, one of which was located in the lower lid. This lesion appeared as a small, slightly elevated, waxy nodule composed of white seedlike lobules; it had the characteristic central umbilication. The other lesion occurred in an adult as a single nodule of somewhat similar appearance located at the margin of the lid. The clinical diagnosis here lay between papilloma and nevus, since the lesion was single and was located at the margin of the lid, and umbilication was questionable.

Under the microscope these tumors were composed of masses of hypertrophic, swollen, degenerated epithelial cells. The basal or germinal cells were somewhat enlarged and showed a few mitoses. Just outside the germinal layer the cells were greatly swollen and vacuolated and the nucleus was atrophic and pushed to one side by the cytoplasmic inclusion bodies, which were made up of myriads of minute spherical virus particles or elementary bodies. At the apex of the lesion many of the cells were ruptured and desquamating. There was little or no inflammatory reaction in the adjacent tissues.

Malignant Melanoma.—A malignant neoplasm supposedly arising from a nevus. This tumor had been present for three years in an elderly man, beginning as a small subcutaneous nodule in the lower lid. The mass had enlarged slowly for two years but during the past year had grown rapidly. At the time of admission the tumor appeared as a large subcutaneous mass in the temporal portion of the lower lid; it measured approximately 2 by 2 by 1 cm. The growth had infiltrated the tarsus, palpebral and bulbar conjunctivae and evidently the sclera, since ocular rotations were limited. The overlying skin was stretched and had a bluish sheen but was freely movable over the growth. Following removal, microscopic examination showed an unusual neoplasm growing wild in a fibrous tissue stroma. The tumor cells, which were arranged in whorls, nests and strands, were spindle shaped with

oval, deep blue nuclei and fairly abundant cytoplasm. A few mitoses were noted. Parts of the tumor were suggestive of basal cell carcinoma and others had the appearance of sarcoma. Aniline blue stains showed no fibrils. Scattered throughout the tumor was a fine granular pigment, most of which was incorporated in phagocytic cells in the stroma but some of which appeared in the tumor cells. This pigment did not give the iron reaction and was believed to be melanin.

Sweat Gland Adenoma.—A tumor that had grown slowly for many years was seen in an elderly man. The growth was located at the margin of the lower lid; it measured 4 by 4 by 6 mm., was attached by a broad base and had a smooth, slightly pigmented surface. Clinically it was believed to be a nevus. Under the microscope the tumor was composed of alveoli lined

Fig. 9.—Xanthelasma: The xanthoma cells appear black.

with cuboidal epithelium. Here and there the basal cells of the epidermis extended downward in finger-like processes into the tumor. The stroma was composed of loose fibrous tissue with a few blood vessels. There were subepithelial infiltrates of lymphocytes and plasma cells. The surface of the tumor was irregular, and a small ulcer had formed in one area.

Xanthelasma.—A lipin degeneration of the dermis and subcutaneous tissues, which, while not a tumor, sometimes has the clinical appearance of one. This case, as is usual, occurred in an elderly woman as bilateral, yellow, flat, slightly elevated areas at the nasal side of each lower lid.

Under the microscope the epidermis appeared normal and only a few fat globules were found in the dermis. In the subcutaneous areolar tissue were nests or groups of large, slightly granular, single or multinucleated xanthoma cells filled with fat; these cells stained only lightly with hematoxylin and eosin but assumed a deep orange color with sudan III. The cell nests were separated by a loose connective tissue stroma. No fat was found in the fibers of the orbicularis muscle.

Granuloma.—A small, rapidly growing subcutaneous tumor appeared at the temporal side of the lower lid in a young woman. There was no history of injury or any other lead as to the possible cause of this growth. The nodule measured approximately 3 mm. in diameter and was not tender to palpation and the overlying skin was not discolored. Microscopic examination revealed a dense connective tissue, infiltrated, especially in the perivascular areas, with lymphocytes and an occasional plasma cell.

CONCLUSIONS

In a series of 100 consecutive tumors of the lid which were studied clinically and with the microscope, eighty-four were of various benign types and sixteen were malignant.

The benign tumors were classified as follows: papillomas 34, nevi 17, sebaceous cysts 13, fibromas 5, sudoriferous cysts 4, hemangiomas 4, dermoid cysts 2, molluscum contagiosum 2, sweat gland adenoma 1, xanthelasma 1, and granuloma 1. Of the malignant tumors, fifteen were carcinomas and one was a malignant melanoma.

It is apparently sometimes difficult or impossible to make an accurate clinical diagnosis. Papilloma, nevus and fibroma and at times early epithelioma are easily confused if they are at all atypical in appearance. Molluscum may be difficult to differentiate, especially if the nodule is located at the margin of the lid. A sebaceous cyst may be confused with fibroma or xanthelasma. Fortunately carcinoma is usually easily diagnosed although, in the early stages, before ulceration, it may be difficult to differentiate from a papilloma, nevus or fibroma.

ABSTRACT OF DISCUSSION

DR. ARNOLD KNAPP, New York: The authors have presented an excellent survey of the tumors of the lid and I wish to compliment them on the beautiful histologic pictures. In the case of tumors of the lid a mental picture of the histologic nature of the process is a great help to the proper treatment of the condition. It occurred to me that a report of a carcinoma of the meibomian gland may be in place today. This occurred in a woman, aged 59, whom I saw in 1926, with a swelling of the upper lid measuring about an inch by half an inch, definitely in the tarsus, with the overlying skin not involved and not tender. The conjunctival surface of the lid was definitely reddened, nodular and bulging into the conjunctival sac and there were no glandular involvements. The tumor was removed from the inside of the lid in the manner in which a tarsectomy is performed. Except for a slight recurrence at the temporal extremity four months later, the patient had no further trouble from the lid. The microscopic examination revealed it to be carcinoma. A year later a swelling appeared in the preauricular region of that side. This was removed by a general surgeon and required a second operation about nine months later, when radium seeds were implanted. Slowly in the course of the next few years the glandular involvement descended along the side of the face and the side of the neck, and ultimately the patient developed symptoms of an abdominal tumor, from which she died in 1933. One reason for mentioning this case is that at one stage of its development it would undoubtedly have been taken for a chalazion. I feel that many conditions are operated on which are not chalazia, and I am ready to confess that I have made this mistake many times. It proves that a microscopic examination is indicated whenever one sees a chalazion-like tumor which is in any way atypical or which recurs.

DR. ALGERNON B. REESE, New York: For comparison with the authors' group of cases, I have listed 100 consecutive tumors removed from the lids at the Eye Institute of New York:

epithelioma 28 (basal cell 21, squamous cell 4, basal-squamous cell 3), papilloma 18, hemangioma 11, nevus 8, sebaceous cyst 6, dermoid cyst 5, sudoriferous cyst 5, granuloma 4, adenoma 3, neurofibroma 3, malignant melanoma 2, xanthoma 2, lymphangioma 1, lymphosarcoma 1, teratoid tumor 1, foreign body reaction 1, traumatic inclusion cyst 1. In this series the epithelioma is the most frequent and it assumes greater importance on the lid than elsewhere on the skin because in the treatment by surgery or irradiation a possible disturbance of function must be taken into consideration. This may be in the nature of a defect of the lid margin which may be not only a cosmetic blemish but may prevent proper protection of the eye. In irradiation, the danger of cataract is always present, no matter how carefully the eye is shielded. In two thirds of the cases the lower eyelid was affected. Even a higher percentage of epitheliomas occur on the lower lip rather than the upper. The reason usually given for the predilection of an epithelioma for the lower eyelid and lower lip is that these are the areas which have the greater exposure to the actinic effect of the sun. Another possible reason is the more frequent irritation to which these parts are subject. Certainly the lower lid is more frequently and more severely involved by blepharitis. Our cases also show, as do the authors', that the basal cell is about five times more common than the squamous cell epithelioma. This is fortunate because, as the authors pointed out, the squamous cell type may metastasize especially to the regional lymph nodes, whereas the basal cell type does not. The authors include the dermoid cysts in their group of lid tumors, but these should perhaps more properly be considered orbital lesions. The heading "granuloma" includes three cases which we call, for purposes of identification, novocainoma. Sometimes following an injection of procaine hydrochloride into the lids for a surgical procedure there occurs over the site of the injection a lump, the center of which is necrotic tissue surrounded by granulation tissue with many foreign body giant cells. Various special stains fail to disclose bacteria or any foreign substance. It is assumed, therefore, that the reaction is due to a chemical change. We have had this lesion occur a number of times, always in groups, and they cease with the use of a fresher solution of procaine. The xanthomas did not resemble, clinically or histologically, xanthelasma. They were round, fatty tumors near the lid margin occurring in patients aged 8 months and 38 years. The teratoid, or composite, tumor was at the base of the nose adjacent to the inner canthus. It was encapsulated and contained cartilage, myxomatous tissue and fibrous tissue throughout which was irregular epithelial masses which formed acini and epithelial pearls. It is often difficult to state the exact nature of a lid tumor clinically.

The Corpus Luteum.—The growing follicle reaches full bloom ordinarily about half way between two menstrual periods, in the case of women who menstruate at the usual four weekly intervals. And then its thinned-out wall breaks, allowing the egg to escape, this process being designated as ovulation. The liberated ovum now is drawn toward the open mouth of the tube by the action of the current produced in the fluid by the ciliary action of the cells of the tube, as has been already explained. Let us for a moment leave the egg at the tubal entrance and see what now happens in the ovary. The follicle, having discharged its ovum and fluid, remains as a collapsed shell. But, instead of shriveling up and disappearing, this rises like a phoenix from its ashes, beginning now a second period of growth, during which it assumes a yellowish carrot-like color. For this reason the new structure is called a yellow body or corpus luteum. It increases steadily in size until just before the next menstrual period, and as it grows it, like the preceding follicle, produces substances which are given off into the blood stream, and which bring about important changes in the endometrium. These changes complete the preparation of the uterine mucous membrane for the implantation of the egg if it happens to have been fertilized, so that such an egg finds its bed nicely prepared when it reaches the womb. In the case of the corpus luteum, as we shall see, two substances are thus produced to act upon the womb, both being necessary properly to prepare the latter for the expected little visitor.—Novak, Emil: The Woman Asks the Doctor, Baltimore, Williams and Wilkins Company, 1935.

THE TREATMENT OF CHOREA MINOR BY MEANS OF ELECTROPYREXIA

CLARENCE A. NEYMANN, M.D.
MAURICE L. BLATT, M.D.
AND
S. L. OSBORNE, B.P.E.
CHICAGO

The therapy of chorea minor, or Sydenham's chorea, has always been empirical and symptomatic. The usual recommendations for treatment have been bed rest, a quiet environment, hydrotherapy and arsenicals, especially solution of potassium arsenite, combined with the judicious use of sedatives and hypnotics. Under this regimen the disease, which is self limiting, usually disappears in from two to six months, depending on the severity of the attack and the resistance of the individual. Most neurologists and pediatricians have classified the malady as "rheumatic." While sudden shock, trauma or fright can play a rôle in bringing on the initial attack, it is generally conceded to be a disease of toxic infectious origin closely allied to rheumatoid infection. Chorea has a definite tendency to recur once

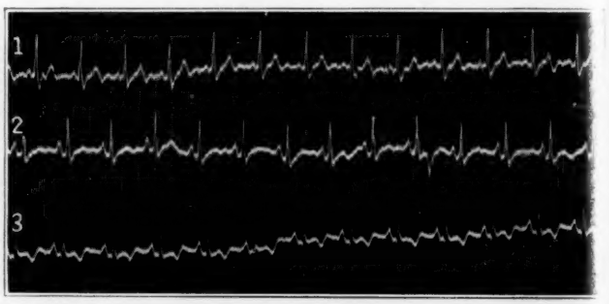


Fig. 1.—Tracing in case 17, Aug. 23, 1935, before treatment, showing sinus tachycardia. The patient, a girl aged 16, had chorea with rheumatic carditis. The heart rate was 125. T_1 and T_2 are positive, P_2 and T_3 increased. These changes are frequent in rheumatic carditis.

it has attacked an individual and is thrice as common among females as among males. It is dominantly a disease of childhood and adolescence.

In 1929 Roeder [1] reported having treated a child suffering from chorea with phenyl-ethyl-hydantoin, or nirvanol, intending to use the drug as a sedative. The typical nirvanol sickness developed with exanthema and fever. This patient, as well as another treated in the same manner, lost all choreiform movements in a very short time. Following this communication, a series of cases successfully treated in a similar manner were reported in this country and abroad.[2] Gradually the fundamental fact that the fever produced by the drug is the important factor came to be recognized. Sutton,[3]

Read before the Section on Pediatrics at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 14, 1936.

From the Departments of Neuropsychiatry and Physical Medicine of Northwestern University School of Medicine and the Department of Pediatrics of the University of Illinois College of Medicine and the Cook County Hospital.

1. Roeder, F.: Ueber die Anwendung von Schlafmitteln in der Kinderheilkunde mit besonderer Bervecksichtigung des Nirvanols, Therap. Monatsh. **33:** 54-63, 1929.

2. Poynton, F. J., and Schlesinger, B.: Treatment of Chorea by Nirvanol, Lancet **2:** 267-270 (Aug. 10) 1929. Gottlieb, A.: Ueber Nirvanol Behandlung der kindlichen Chorea Minor, Monatschr. f. Kinderh. **43:** 433-438, 1929. Pilcher, J. D., and Gerstenberger, H. J.: Treatment of Chorea with Phenyl-Ethyl-Hydantoin, Am. J. Dis. Child. **40:** 1239-1249 (Dec.) 1930. Dennett, R. H., and Wetchler, Samuel: Nirvanol Treatment of Acute Chorea in Children, J. Pediat. **1:** 203-209 (Aug.) 1932.

3. Sutton, L. P.: The Treatment of Chorea by the Induction of Fever, J. A. M. A. **97:** 299-301 (Aug. 1) 1931.

Sutton and Dodge [4] and Bateman [5] employed typhoid vaccine injections for the purpose of elevating the patient's temperature. Their results were excellent. By the use of typhoid vaccine they were able to avoid the nirvanol sickness, which has the disadvantages that it not only takes about two weeks to develop but also usually causes severe illness and occasionally death. Sutton and Dodge fully appreciated the value of fever, per se, for they increased the febrile reactions of their patients by enveloping them in blanket packs after the typhoid vaccine injections. Unfortunately, one death occurred in their series as a result of this procedure. Before Sutton, Mas de Ayala [6] had employed Malta fever in the treatment of chorea, and as far back as 1923 von Kern [7] reported favorable results after milk injections. However, he did not attribute his results to the fever produced by the injections.

Although we believed that the treatment of chorea by means of electropyrexia was desirable and had contemplated such treatment shortly after Neymann and Osborne [8] first introduced this therapy, there were physical factors that made its application unpractical at this time. Treatment with penetrating heat, i. e., diathermy or radiothermy, was extremely difficult because of the constant movement of the children afflicted with chorea. Furthermore, the use of external heat seemed inadvisable to us because we did not believe that the high pulse rate and general physical exhaustion produced by this modality would recommend its use in a disease often associated with acute and chronic rheumatic carditis. We therefore did not attempt to employ electrical hyperpyrexia in chorea until August 1934, at which time electromagnetic induction by means of high frequency currents became a feasible method for the production of fever.

A preliminary report of the results in the first seven cases of this series was made by Neymann [9] on April 30, 1935. The treatment of eighteen more cases has since been completed. The choreiform movements of all these twenty-five patients ceased after a series of biweekly fever treatments.

Clinical Results of Treatment of Chorea Minor with Electropyrexia

Case	Sex	Age	Severity	Additional Data	Number of Previous Attacks	Number of Treatments	Treatment Days in Hospital	Number of Months Since Last Treatment	Result
1	♂	9	Moderate	.....	3	2	5	20	A few slight twitchings since discharge
2	♂	9	Mild	Hemichorea	0	2	5	19	No twitchings since discharge
3	♀	11	Mild	.....	0	3	18	18	No twitchings since discharge
4	♂	11	Moderate	.....	0	2	10	17	A few slight twitchings since discharge
5	♀	11	Severe	.....	0	4	30	16	No twitchings since discharge
6	♀	9	Mild	.....	0	2	7	15	No twitchings since discharge
7	♀	4	Mild	Chorea developed after scarlatina	0	3	17	14	No twitchings since discharge
8	♂	11	Severe	.....	2	2	21	10	No twitchings since discharge
9	♀	9	Severe	Aphasic before treatment	0	10	39	9	No twitchings since discharge
10	♀	9	Mild	.....	1	3	9	9	No twitchings since discharge
11	♀	8	Severe	.....	0	5	21	9	Chorea recurred
12	♀	14	Severe	Chorea of seven months' duration	Chronic	2	21	9	No twitchings since discharge
13	♀	13	Severe	.....	0	4	12	8	No twitchings since discharge
14	♀	13	Moderate	Rheumatic carditis	2	4	14	8	No twitchings since discharge
15	♂	7	Mild	Rheumatic carditis	0	2	9	8	No twitchings since discharge
16	♀	8	Mild	.....	0	2	6	8	No twitchings since discharge
17	♀	16	Moderate	Rheumatic carditis	2	3	9	7	A few slight twitchings since discharge
18	♂	8	Moderate	Chorea of four years' duration	Chronic	9	30	6	No twitchings since discharge
19	♂	9	Severe	Rheumatic carditis	1	9	31	5	Chorea recurred
20	♀	10	Mild	.....	0	5	16	5	No twitchings since discharge
21	♀	10	Mild	Rheumatic carditis	1	2	5	5	No twitchings since discharge
22	♀	13	Severe	.....	0	5	16	4	No twitchings since discharge
23	♀	13	Severe	Great speech difficulty before treatment	0	5	17	2	No twitchings since discharge
24	♂	9	Mild	Hemichorea; rheumatic carditis	0	2	6	2	Chorea recurred
25	♂	7	Moderate	Rheumatic carditis; acute rheumatic fever	0	7	23	1	No twitchings since discharge
					Average	4	16		

For purposes of clinical classification, the group has been divided into severe, moderately severe and mild types. Nine cases were considered very severe and six moderately severe; ten presented a comparatively mild form of the disease. The average period of hospitalization for all cases was less than sixteen days, and the average number of treatments given was

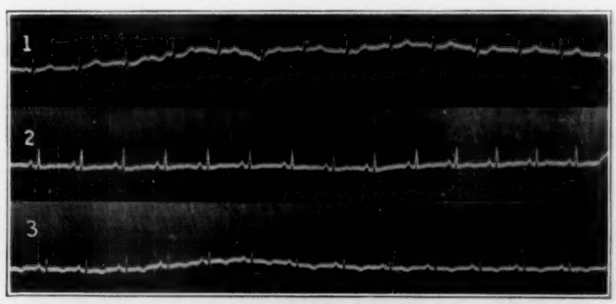


Fig. 2.—Sept. 24, 1935, after three treatments: Heart rate, 110. T_1 is positive, T_2 slightly positive. A normal electrocardiogram.

4. Sutton, L. P., and Dodge K.: The Treatment of Chorea by Induced Fever, J. Pediat. **3:** 813-826 (Dec.) 1933.

5. Bateman, D.: Treatment of Sydenham's Chorea, Brit. M. J. **1:** 1003-1004 (June 10) 1933.

6. Mas de Ayala, I.: Estudio Clinico de la Fiebre Recurrente Espanola Experimental, An. de Fac. de med., Montevideo **15:** 544-682 (July-Aug.) 1930.

7. von Kern, T.: Die Behandlung der Chorea Minor mit Milch Injectionen, Wien. klin. Wchnschr. **36:** 164-165 (March 1) 1923.

8. Neymann, C. A., and Osborne, S. L.: Artificial Fever Produced by High-Frequency Currents: Preliminary Report, Illinois M. J. **56:** 199-203 (Sept.) 1929. Neymann, C. A., and Osborne, S. L.: The Treatment of Dementia Paralytica with Hyperpyrexia Produced by Diathermy, J. A. M. A. **96:** 7 (Jan. 3) 1931.

9. Neymann, C. A.: Treatment of Disease by Electropyrexia, Lancet **1:** 1102-1104 (May 11) 1935; The Treatment of Disease by Means of Electropyrexia, Proc. Roy. Soc. Med. **29:** 151-161 (Dec.) 1935.

slightly less than four. The longest period of hospitalization was thirty-nine days. This child had a very severe chorea, and ten biweekly treatments were given before all twitchings ceased. These ten treatments were the greatest number administered to any one patient. The shortest period of hospitalization was five days, during which time interval two treatments were given. After treatment was begun, the average number of days

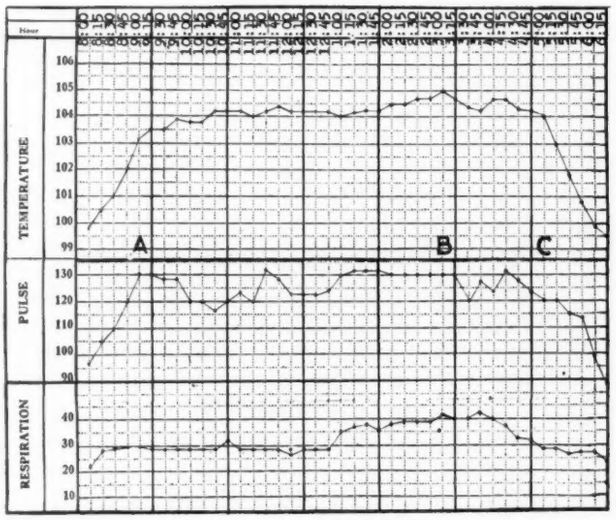


Fig. 3.—Usual fever curve produced by electromagnetic induction for the treatment of Sydenham's chorea. Temperature maintained above 103.5 F. for eight hours. Temperature ranges near 104 F.; highest, 105 F. Case 24, T. R., Sydenham's chorea, rheumatic carditis, March 12, 1936, second and last treatment. *A*, current off; *B*, patient partially uncovered; *C*, uncovered.

spent in the hospital by the nine very severe cases was twenty-three, while the mild cases averaged ten. During the period of hospitalization, the child remained in bed without any other medication. The patients were not discharged until all pathologic movements had ceased.

The accompanying table is a survey of our series and the results obtained by treatment. These cases were not selected but were treated as they were admitted to the Cook County Hospital from August 1934 to April 1936. There were nine boys and sixteen girls, varying in age between 4 and 16 years. The tendency of the disease to attack females and young children is shown in the table. The period of observation after treatment now varies between one and twenty months. There have been three recurrences of the disease (cases 11, 19 and 24); one was in a girl and the other two were in boys. Their choreiform movements returned within a few weeks after their discharge from the hospital. Case 19 was probably a nonsuppurative encephalitis rather than a rheumatic chorea and should perhaps not be included in this series. The boy has developed into a behavior problem and institutional care has been advised. None of the other patients have shown a return of their symptoms, though eight of the series had had either chronic chorea or previous attacks of the disease. Hardly enough time has elapsed to make a definite statement except in the first seven cases. Here certainly the disease seems to have been arrested. Two cases (2 and 24) of hemichorea were observed. One patient (case 9) was totally aphasic before treatment was begun, two had a chronic form of the disease and in seven cases the disease was complicated with rheumatic carditis. Only one of these (case 17), however, showed pronounced electrocardiographic changes. Figures 1 and 2 show the electrocardiograph in this case before and after treatment. The improvement after treatment is apparent.

Whenever a child with intercurrent carditis was treated, great care was used not to raise the temperature too high during the first febrile session. In such cases we contented ourselves with a maximum temperature of 39.7 C. (103.5 F.) lasting two or three hours, during the first treatment period. Three such children complained of difficulty in breathing during the first febrile session. For this reason the treatment was terminated after three hours rather than continued for the usual time. Three days later, treatment was repeated and all these patients finished the course without further difficulty. They were retreated until their twitchings ceased. In our series, just as in that reported by Sutton and Dodge,[10] artificial fever, carefully administered, did not harm patients with rheumatic carditis. We noted a frank clinical improvement after treatment in all the patients with this complication. The fact that we were able to give the usual type of treatment after the initial conservative session and produce the usual type of fever curve seems to us to demonstrate the benign therapeutic action of fever in rheumatic carditis. A typical example of the usual fever curve produced by us in the treatment of uncomplicated chorea is shown in figure 3. The temperature was raised to 39.7 C. (103.5 F.) as rapidly as possible and maintained between 39.7 C. (103.5 F.) and 40.6 C. (105 F.) as a maximum for eight hours.

We ordinarily do not employ temperatures of greater height because in our experience they are unnecessary and some children develop convulsions when a fever above 40.6 C. (105 F.) is reached. A patient who develops a convulsion during a fever treatment is in potential danger, for the muscle activity in itself may suddenly send the fever to a point at which a heat stroke results. This point is 42.5 C. (108.5 F.) and above. In case 2 of our series such a convulsion developed during the second treatment when the temperature

Fig. 4.—Portion of the cable under the treatment bag for producing artificial fever by electromagnetic induction.

reached 41 C. (105.8 F.). The patient was rapidly cooled by uncovering him and blowing air over his nude body with an electric fan. After this observation we usually kept the temperature below 40.6 C. (105 F.) and no further complications of this type resulted. Another patient developed a transient albuminuria with

10. Sutton, L. P., and Dodge, K.: The Effect of Fever Therapy on Rheumatic Carditis Associated with Chorea, J. Pediat. **6**: 494-512 (April) 1935.

hematuria during treatment. The therapy was not interrupted, however, and the urine cleared up promptly. Herpes labialis occurred in about 50 per cent of the children treated. Treatments were given biweekly in most cases, and in one or two instances only once a week. We believe that the latter is not sufficiently frequent; certainly it lengthens the period of hospitalization. Some investigators are now treating their patients three times a week or even every day. Such

Fig. 5.—Treatment for chorea minor with electromagnetic induction using the treatment bag. The coil carrying the current is here placed on the chest of the patient in the form of a pancake.

tive therapy will undoubtedly further shorten the period of hospitalization, but we believe that it places too great a strain on the patient's cardiovascular reserve.

As before stated, electromagnetic induction was the modality employed for inducing fever. This method uses a current oscillating at the rate of approximately fifteen million cycles a second. The current is led through a flexible cable, which is placed above or below the patient. The electromagnetic flux produces eddy currents in the patient's body, depending in intensity on the quantity of electrolytes present in the various tissues. The greatest concentration of electrolytes is found in the blood stream, muscles and internal organs, and the least in skin and fat. For this reason the deeper lying tissues are heated more intensely than the superficial fat and skin. Thus we have a method which produces heat internally. This method never produces burns when properly applied.

For the purpose of heat insulation, the patient is placed in a treatment bag similar to that used for outdoor sleeping. The cable carrying the current is formed into a pancake coil and rests over the patient's chest and abdomen or under the patient's back, shaped as an elongated loop extending from the shoulder blades to the middle of the calf. With either method, the cable carrying the current is placed outside the bag. About 2½ inches of heat insulating nonelectrolytic material, such as blankets, cloth, kapok, wool or cotton, must be placed between the cable and the patient. After the desired temperature of 39.7 C. (103.5 F.) is reached, the current is turned off and the temperature usually coasts a degree or a degree and a half Fahrenheit higher. A pyrometer couple or thermocouple connected with a pyrometer may be inserted in the rectum after the current is turned off. This lightens the labor of the personnel. Figures 4 and 5 illustrate the treatment.

If available, an air conditioned cabinet (fig. 6) instead of the treatment bag may be used to maintain the temperature during the entire treatment. The advantages of such a cabinet are twofold; the patient may move his extremities freely and may change the position of his entire body within the machine. In treating children, who complain less than adults during electropyrexia, these advantages are partially outweighed by the cost of the apparatus and the time spent in training necessary personnel. We wish to stress the point that the cabinet is never used to produce fever but only to maintain it. In this cabinet the air, saturated with enough water vapor to produce a humidity of from 85 to 95 per cent, is circulated at a rate of about 250 cubic feet a minute. The temperature of the air can be regulated to vary between 35 C. (95 F.) and 45 C. (110 F.). This air, with its comparatively low temperature and high humidity, circulating at the rate prescribed, will maintain any desired febrile level when that degree of temperature once has been attained by means of electromagnetic induction. The atmospheric conditions within such a cabinet can be likened to those encountered in the sweltering tropics preceding a downpour of rain. These conditions do not produce the high pulse rates described by Benson [11] and by Phillips and Shikany [12] caused by the overheating of the surface of the skin. The strain on the cardiovascular reserve is therefore lessened.

Attention to the details of nursing care is essential. The patient is not permitted to have breakfast before the treatment. He is given a cleansing enema before being placed in the bag or cabinet. During treatment, fruit juices, with lactose added, water and, in case of complaint of hunger, milk may be given. All liquids should have enough salt added to form a saline solution of 0.6 per cent. This will replace at least part of the

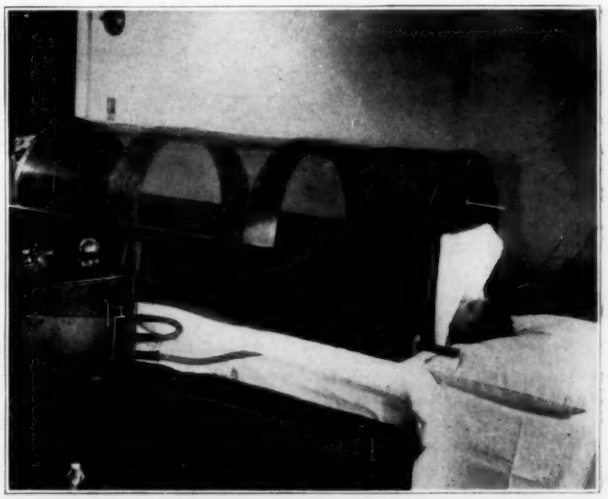


Fig. 6.—The treatment of chorea minor by means of electromagnetic induction. The patient is placed in an air conditioned cabinet having the temperature of from 105 to 110 F., with a humidity of from 85 to 95 per cent. The cabinet is used to maintain the fever after this has been produced by electromagnetic induction.

sodium chloride lost by perspiration. Convulsions, a decrease in respiratory rate to less than 12 per minute, cyanosis or an increase of the heart rate to 160 per minute or more are indications for the immediate cessa-

11. Benson, S.: Relative Influence of External and Body Temperatures upon the Heart, Arch. Phys. Therapy **15**: 303-308 (May) 1934.
12. Phillips, K., and Shikany, S.: The Value of Hyperpyrexia in the Treatment of Bronchial Asthma, South. M. J. **28**: 801-814 (Sept.) 1935.

tion of treatment. Complaints of pain around the heart and shortness of breath are likewise indications for terminating the session if the patient is one with an intercurrent rheumatic carditis.

Since the preliminary report of Neymann in April 1935, reports on thirty-one other cases of chorea treated by artificial fever produced by physical agents have appeared in the literature.[13] Twenty-eight of the thirty-one were reported as recovered or greatly improved. About 20 per cent showed a return of choreiform movements. The results herein reported are more satisfactory. All our patients recovered directly after treatment, and only three, or 12 per cent, showed a recurrence of their former symptoms. We believe that this is due to the fact that all treatments were individualized. This was possible because of the ease with which electromagnetic induction could be applied and the fact that the amount of electric current, the heating medium, could be instantly controlled.

SUMMARY

1. Twenty-five cases of chorea were treated by artificial fever produced by electromagnetic induction.
2. In all cases, the choreiform movements ceased promptly.
3. The average period of treatment and hospitalization was sixteen days; an average of four treatments were given each patient.
4. The chorea recurred in three children.
5. Electropyrexia is not contraindicated in rheumatic carditis complicating chorea.
6. In contrast to devices dependent on external heat, electromagnetic induction seems to us to be a superior method for producing therapeutic hyperpyrexia.

104 South Michigan Boulevard.

ABSTRACT OF DISCUSSION

DR. MAURICE L. BLATT, Chicago: The criteria of a treatment are dependent on the necessity for its use and on its safety. In this series of cases, its safety was apparently well proved. The complications commonly found in chorea did not appear in increasing numbers, nor were the complications already present aggravated by the institution of hyperpyrexia with electrical induction. The treatment, however, is not a simple one. It is not the type of treatment that one would recommend for the general use of individuals not experienced in the handling of such apparatus. Dr. Neymann's previous experience with hyperpyrexia in the treatment of more chronic diseases, however, warranted our attempting this series of cases. In a general hospital, such as the Cook County, the number of days of hospitalization is a factor of considerable economic importance. In our previous series of cases, we found that approximately five to six weeks, with nursing care and sedation, was the usual period of hospitalization necessary for these patients. In addition, the incidence of endocarditis or rheumatic carditis was a factor of some consequence, since many of these patients returned to us at a later date with cardiac decompensation or with acute exacerbation of an endocarditis the primary occurrence of which was recorded during the first choreiform attack. We have examined these cases since their discharge and have found no manifestations of endocarditis not recorded at the time of entrance or the time of discharge from the hospital. It has seemed to us that if we could shorten the course of the disease process associated so frequently with endocarditis we might cut down the number of cardiac cases that come back to us at a later date. In this series we were able to shorten the period of hospitalization. We did so apparently without harm to any of these patients. We probably prevented the occurrence of a number of cases of rheumatic carditis and, to date, but two cases of chorea have recurred.

DR. C. A. NEYMANN, Chicago: We believe that our efforts have been worth while because we have had no deaths, because, if anything, the rheumatic carditis was improved after treatment and not aggravated, and because the patients seemed, after months of treatment, to be in better general physical condition than one would ordinarily expect, especially in the patient who had developed a more or less chronic recurring chorea.

13. Desjardins, A. U., and Popp, W. C.: Our Experience with Fever Therapy, report of the 5th annual Fever Conference, May 16, 1935, pp. 7-8. Metz, M. H.: Some Unusual Cases Treated with Fever Therapy, ibid., pp. 101-104. Hefke, H. W.: Report of the First Year of Fever Therapy at the Milwaukee Hospital, ibid., pp. 29-30. Wetchler, Samuel: Chorea in Children, M. Rec. **142**: 30-33 (July) 1935. Schnobel, T. G., and Fetter, F.: Fever Therapy in Gonorrheal Arthritis and Chorea, Ann. Int. Med. **9**: 398-405 (Oct.) 1935.

OSTEOMYELITIS OF THE FRONTAL BONE

NOTES ON THREE CASES

H. P. MOSHER, M.D.
BOSTON

As the title indicates, I am not writing a systematic paper or one that attempts to cover the subject of osteomyelitis of the frontal bone in any way approaching thoroughness. I shall pick and choose, perhaps from old habit leaning toward the dramatic, stressing the points from which I have learned something, and those which strengthen convictions which have been gradually and somewhat laboriously built up in my mind on this subject during the past five or six years. During this time I have seen, I will not say, the full light but some light.

In two of the cases which I am to comment on, large portions of the frontal bone were removed in one piece. One measured 2 by 2½ inches, the other 3 by 2½ inches. It was possible, therefore, to get large sections for histologic study. Before, I have had small pieces taken from known positions in the frontal bone and drew my conclusions as to how far the infection spread from them. The large histologic sections which I am reporting on here, many of them serial sections, made it possible to trace the infection by continuity until it disappeared, and to see the routes by which it traveled. The conclusions stated in my earlier paper have been amply confirmed. I shall present the histologic observations of the new specimens as briefly as possible. From the practical standpoint, they are the most important facts that I have to present.

I was not the operator in any of the cases. In each from time to time I acted as consultant. The operators' names, to use theatrical language, are given in the order of their appearance.

SUMMARY OF CASES

CASE 1 (surgeons, Drs. P. E. Meltzer, R. L. Goodale and H. G. Tobey).—A woman, aged 21, received a black eye on the left while wrestling. One week later, while riding in an automobile, she noticed a swelling in the middle of the forehead. It became painful ten days later.

On admission to the hospital there was an elliptic swelling in the median line of the forehead, which was fluctuant and painful on pressure. The patient's chief symptom was severe headache.

At operation the median skin incision evacuated a large amount of pus from a pocket under the skin. The central

Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

This article, on account of lack of space, is abbreviated in THE JOURNAL by the omission of numerous illustrations. The complete article will appear in the Transactions of the Section and in the author's reprints.

portion of the frontal bone for an area about the size of a 50 cent piece (30 mm.) was bare of periosteum and moth eaten. The surrounding bone for 1 inch laterally and up to the hairline appeared normal. The periosteum was intact but, when the bone was drilled, pus escaped from the diploe. With the electric drill, an elliptic area of bone measuring 2½ by 2 inches was outlined and removed. The bone was adherent over an extradural abscess, and the dura presented many granulations. There was no evidence of a cerebral abscess.

The patient's convalescence was uneventful. About six weeks later, Dr. Kazanjian did a plastic operation for closure of the flaps. The lower end of the midline incision had to be opened later and wicked for a short time.

Two months after her discharge and four months after her original illness, the patient was readmitted.

The edges of the bone defect showed no osteomyelitis. She now had all the signs of a frontal lobe abscess. The first brain exploration was negative. At the second, an abscess was found deep in the left frontal lobe.

The choking of the disks was especially marked, reaching 6 diopters in each eye. The other cardinal sign of increased intracranial pressure, namely, the pressure of the spinal fluid, was always high and rose at one time to 600. At this time a reinvestigation of the abscess gave no further pus. Tapping of the left ventricle gave neither pus nor fluid. The patient then became thoroughly septic. She had two anginal attacks, a pneumonia of the right upper lobe and a question of a mesenteric infarct.

The blood culture was never positive. The organism from the brain abscess was Staphylococcus albus. The white count varied from 13,200 on admission to 9,850. The fields could never be taken satisfactorily.

The autopsy showed multiple abscesses in the right frontal lobe which had not been found. On the left there were no abscesses. The abscess which had been found on the left had been extruded. About three fourths of the left frontal lobe had sloughed away and the right was filled with abscesses.

There was no meningitis.

I interpret this case as one of localizing osteomyelitis which started after trauma. The exposure on the automobile ride probably played a part in hurrying things along. It has been known for a long time that after a Killian frontal sinus operation an automobile ride with the wind shield up is very liable to cause a blow up in the operative wound.

The patient was operated on radically and she made an uneventful recovery except for a slight infection at the lower end of the median incision after the plastic operation. This was found to be due to the fact that the right frontal sinus had not completely filled with granulations. This happening occurred in another case not included in this series. It is of no use, therefore, to do a plastic operation until the sinus cavities are fully obliterated by granulations.

I might add at this point that some years ago I stated it was my belief that the surest way to obliterate a frontal sinus is to remove both the anterior and posterior walls as we have done for the past five years almost as a routine in cases of osteomyelitis originating in a septic frontal sinus. At present there is no sure way of obliterating a frontal sinus. In carrying out this procedure, the floor of the sinus is not removed and only a minimum enlargement of the nasofrontal duct is attempted. The ethmoidal cells are dealt with in the customary way.

The most reassuring thing about the case is that the osteomyelitis was cured at the first operation.

The other points which I wish to comment on are as follows: The large bone removal allowed the opened brain abscess to come to the surface and to slough off. Frontal lobe abscesses, when opened, I feel, have a tendency to come to the surface more readily than abscesses in other localities.

The removal of a cone of brain tissue down to the abscess by the diathermy knife, as was done in this case, and the removal of a part of the abscess capsule by the same method I have found an improvement over older procedures.

The point in the case which bothers me the most is the time of the plastic closure; i. e., six weeks. This seems to me to be too short, especially as there had been some infection in the median incision after the plastic operation. I feel that three months would be a safer time.

In making a trephine opening in the frontal bone either to outline the bone flap or for diagnostic purposes, if pus wells up from the diploe in quantity there is an extradural abscess. There may be an extradural abscess even if there is no pus in the diploe; therefore all diagnostic trephine openings should be carried through both tables of the skull to the dura. Extradural

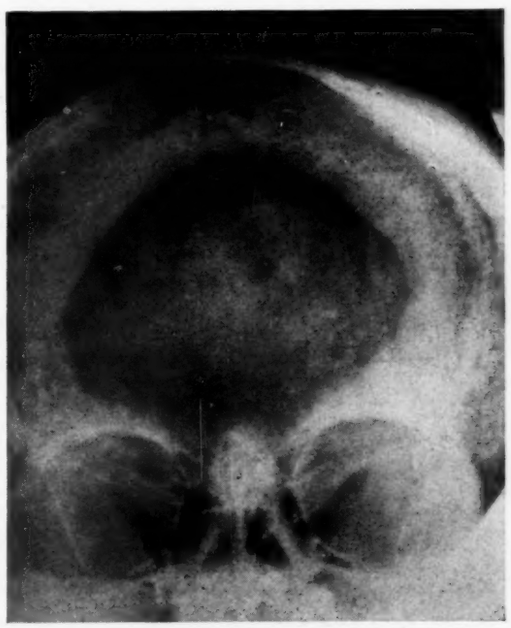


Fig. 2 (case 1).—Bone defect on reentry of patient to hospital. There is no evidence of osteomyelitis.

abscesses are so common that one should expect them and look for them, and not consider them as a rare complication.

In this case there was thrombosis of the superior longitudinal sinus. There is every reason why this should happen in osteomyelitis of the frontal bone and I believe that it often occurs without being recognized. I have known it to be present in several other cases. The emboli probably came from the sinus. When a thrombus is present it must greatly increase the septic load of the patient even without thrombi. Unless, however, the clot goes well back and is large enough to cause pressure on the motor areas of the legs which abut on each side of the sinus, the classic leg symptoms do not appear. They were not present in this case although the sinus was thrombosed to the torcular.

Incontinence of urine was a prominent symptom during the patient's second hospital stay. This is given by some writers as characteristic of a frontal lobe abscess. Dreams and hallucinations are given as further symptoms. The patient did not have either of these. She did, however, develop a great change in character

and a marked loss of memory. A change in character also is supposed to be peculiar to frontal lobe abscess. It has been noted, however, in abscess of the other lobes. Dr. Schall had such a case after a cerebellar abscess. A clinging vine type of wife, on returning from the hospital, changed to the exact opposite and proceeded to beat up her husband.

It was learned quite a few years ago in one of Dr. G. H. Tobey's first cases that a bacteriophage dressing keeps the operative wound cleaner than any other. It was being used in this case. After the brain abscess on the left was found, the temperature remained at about 100 for ten days, when there was a sudden rise and the patient's condition became very poor. It so happened that Dr. Lynch, the house officer in charge of the case, was at our regular Friday evening meeting at the medical school, and the patient's condition was reported to him by telephone. One of the papers

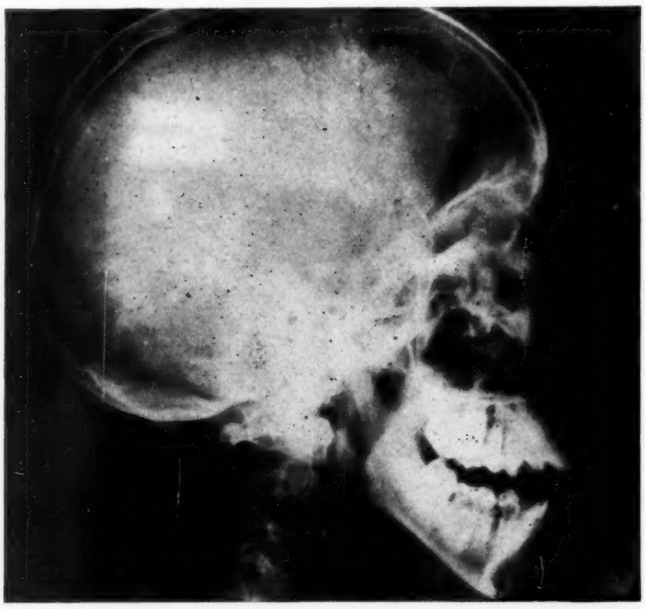


Fig. 9 (case 2).—Enlargement of diploetic vein from infection. See figures 7 and 8.

abstracted that evening was the report of a case of osteomyelitis of the skull. It was a long drawn out affair with many complications and many operations. I never read a more dramatic report. A bacteriophage was used intravenously. The patient recovered, and much of the credit of the recovery was given to this procedure. I suggested that the treatment be tried in our case. This was done and the change for the better in the patient's condition seemed almost a miracle. We were actually stunned by the improvement and almost asked one another if the patient was going to get well.

As was stated in the summary, there were many complications, a pneumonia, two anginal attacks, and a question of a mesenteric thrombosis. During these complications the intravenous use of the bacteriophage was persisted in, seven injections in all being given. Finally it was powerless to combat the general sepsis, the temperature rose again, and the patient died in twelve hours.

CASE 2 (surgeons, Drs. V. J. Kelley, P. E. Meltzer, R. L. Goodale and L. A. Schall).—A boy, aged 14, ran the whole gamut of the complications that can occur in connection with an infection of the ethmoidal labyrinth and the frontal sinus. He started with an infection of the left frontal sinus and the ethmoidal labyrinth. This was aggravated by swimming and he entered the hospital with the left eye closed and pushed down and out. There was marked swelling of the left side of the forehead and left temporal region and marked tenderness in the left temporal fossa. A Lynch operation was done on the left frontal sinus, and the left ethmoidal labyrinth was exenterated. Pus was found in the orbit and in the ethmoidal labyrinth.

The swelling promptly extended to the right frontal sinus and an external operation was done on both frontal sinuses. The bone at the outer angle of the left frontal sinus was found to be necrotic. The patient did poorly.

The roentgenogram showed an extension of the osteomyelitis laterally toward the lower outer angle of the frontal bone, and a bone flap measuring 2 by 2 inches was removed at this place.

Because the spinal pressure rose to 700 and there was a beginning choking of the disks, an exploration for a frontal lobe abscess was performed five days after the third operation, and an abscess was found.

About a month later a small fluctuant swelling appeared (1 by 1 cm.) on the forehead an inch beyond the hairline. The roentgenogram showed the presence of osteomyelitis as far as the coronal suture.

At operation a large abscess was found under the local swelling. The bone was necrotic beneath the abscess, and pus pulsated through a hole in the bone. A bone flap measuring 2½ by 3 inches was removed. This extended from the old bone edge to just beyond the coronal suture and 1 inch beyond the median line to the right.

The wound was very dirty but cleaned up under treatment with bacteriophage.

In a few days over a month, the patient died. Her second hospital stay was two and a half months. Autopsy revealed osteomyelitis of the frontal bone, meningitis and multiple brain abscesses (frontal lobe).

In this case, swimming, I believe, was a decided factor in the extreme infection. Our worst cases of frontal sinus infection and osteomyelitis have followed swimming. We had three such cases in a row.

Another point in connection with this case, a well known point now, is that the roentgenogram was not positive for bone necrosis until nine days after the external swelling appeared.

One usually thinks of osteomyelitis as advancing upward on the front face of the frontal bone instead of extending to the outer angle and progressing from there. In this case, however, the greatest swelling and tenderness were in the left temporal fossa, and a large piece of infected bone was removed from this locality. From a few cases which we have had I have learned to be suspicious of the outer angle of the frontal sinus and of the external angle of the frontal bone. In what I like to call a full operation, the bone flap should extend laterally far enough to reach the outer limit of the frontal sinus and at least encroach on the anterior limit of the temporal fossa.

The subcutaneous abscess which was the last complication could be seen to have its origin in a thrombosed diploic vein. It was striking to see how far the infection traveled by way of the vein from the original source of the infection. It was easy to see in the specimen how an abscess originating in this way could extend both inward and outward, causing both a subperiosteal abscess and an extradural abscess.

CASE 3 (surgeons, Drs. M. H. Lurie, F. E. Garland, V. H. Kazanjian, G. H. Poirier, L. E. White and E. B. Lovesey).—A woman, aged 26, following a cold for ten days, had swelling and tenderness of the left frontal region with edema of the forehead. She had one convulsion. The left half of the frontal bone was removed from the upper limit of the edema down to the frontal sinus, the front wall of which was removed.

Six days later the left ethmoid was exenterated. There was pus in the ethmoidal labyrinth. At the first operation there was a rupture in the dura. At the second operation a small abscess was evacuated through the dural tear. Six days later another abscess was found 2 cm. below the first one.

The headache and vomiting persisted, and eight days later the herniated brain tissue was removed and a large opening was made into the abscess. The recovery from the operation was slow. In the right eye there was 1 diopter of choking of the right disk and three fourths in the left. The choking slowly disappeared.

In the next three months three sequestrums were removed from the right edge of the bone defect. Then the patient had a convulsion and was admitted to the hospital. The next day she had three convulsions. No more convulsions occurred and five days later she was discharged to the neurologic clinic.

About two years later she had ten convulsions, became unconscious, and was admitted to the hospital in coma.

On the day after admission she was operated on. An L shaped flap was turned up by following the old incision. At the lower inner angle of the wound a cystic swelling was present. This was opened and found to contain clear fluid, which proved to be sterile. Two days later the left frontal lobe was explored for brain abscess. No abscess was found. In four days the patient was rational and in ten days she was up in a wheel chair.

A month later a plastic closure of the wound was attempted. Following this, the center of the flap sloughed.

Again a month later, Dr. Kazanjian performed the second plastic operation, transplanting a piece of whole skin to fill the defect.

The patient was discharged April 14, 1936.

This young woman must have a charmed life. I have seldom seen a patient as sick as she was get well. In the four years that she has been coming to the hospital, she has been admitted five times and had nine operative procedures. She seemed to specialize in convulsions.

At no time was the pressure of the spinal fluid high, and the choking of the disks was only moderate.

The important point about the case is that the patient had a complication which may occur, but seldom does, in any healed case of osteomyelitis; namely, an arachnoid cyst. This was accompanied by coma and many convulsions. I have known such a cyst to follow a radical mastoid operation, but this is the first time I have seen it in a case of osteomyelitis. The bone removal included only half of the frontal bone. The bone flap evidently was not large enough, because later two small sequestrums and one large one were removed from the left edge of the bone defect. The bone flap should have included the right half of the frontal bone as well as the left.

THE INCISION

Four types of incision have been used to expose the frontal bone, including a U shaped incision with the base down, a U shaped incision with the base up, and a median incision from the hairline to the root of the nose joined by a horizontal incision paralleling each eyebrow. The fourth incision, advocated by von Eicken, is a right angular incision with the point of the angle at the external angular process of the frontal bone. I prefer a central incision meeting a horizontal incision above each eyebrow. The main point is to get a thorough exposure of the whole front face of the frontal bone. Timid incisions breed timid surgery.

The U shaped flap which turns down does not give full vision of the wound postoperatively, or full drainage. The U shaped flap which turns up should give better cosmetic results. It does not cover the edges of the bone defect well. I am watching one case in which this form of flap was used and cannot give a positive opinion about the flap until the case is further along. The question is what will be the fate of the bare bone.

The right angular flap of von Eicken does not appeal to me, because it limits the exposure of the frontal bone especially at the opposite external angular process of the frontal bone. One of the things, and I have mentioned it before, which I think that I have learned about these cases of osteomyelitis is to watch the external angular process of both sides.

THE REMOVAL OF THE BONE FLAP

Marking out the bone flap by trephine holes made by an electric burr is the quickest and most craftsmanlike method. One worries at first about getting the bone flap free from the superior longitudinal sinus. Experience has shown that slow dissection will readily accomplish this without tearing the sinus.

When, however, the dissection goes hard owing to a marked bowing of the frontal bone and the large size

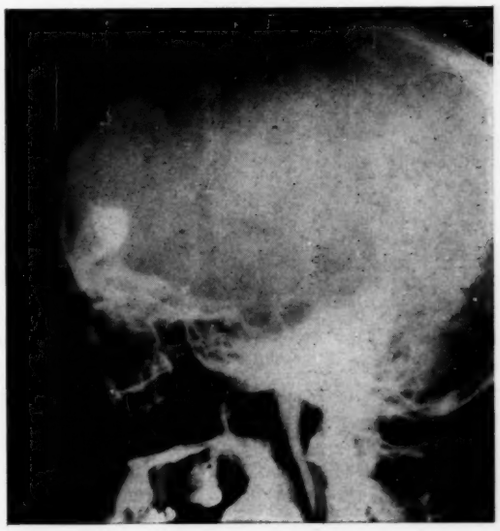


Fig. 13 (case 3).—Cyst after evacuation and filling with iodized oil.

of the bone flap, if half of the bone flap is sacrificed up to the longitudinal sinus, the periosteal elevator can get a straight shot, the operator can see better what he is doing, and the bone flap can be more easily and safely freed from the sinus.

HISTOLOGIC EXAMINATION OF THE BONE SPECIMENS

In the first specimen the bone was taken adjacent to the original source of infection, namely, the frontal sinus, and its vertical diameter extended some 2 inches from the upper rim of the sinus. The second specimen was taken at a distance from the original source of infection, that is, at the top of the forehead, and consisted of a bone flap measuring 2½ by 3 inches. It was perforated in the center by a necrotic area, which connected superficially with a subperiosteal abscess and internally with an extradural abscess.

In the first specimen, in what might be called the more acute case, the marrow spaces were crowded to overflowing with large and small lymphocytes. The majority of the marrow spaces were markedly infected and many of them contained actual abscesses. There was some fibrous tissue, but it did not predominate. Infected vessels were found making their way to the

surface of the bone, both externally and internally. The infection broke through the inner table more often than the outer table. The current of the infection, so to speak, seemed to be more inward than outward. There was some new bone on the surface of this specimen next to the dura. The inner surface of the new bone was covered with a layer of infected blood clot and in places with infected granulation tissue.

The impression which the bone gave was that the majority of the marrow spaces were acutely infected,

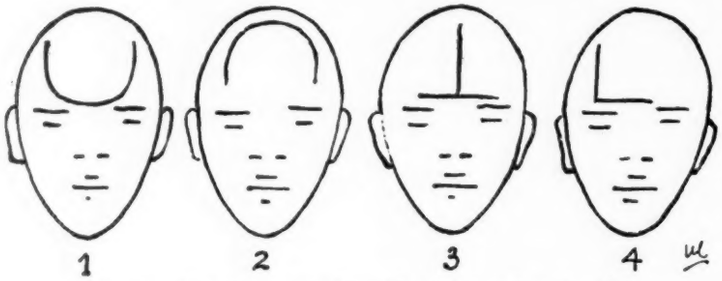


Fig. 14.—Various types of flap. The author prefers the third.

as shown by the great increase of the cellular elements, especially the small and large lymphocytes, and the large numbers of polymorphonuclear leukocytes. In this case the osteomyelitis was circumvented and cured by operation.

In the second specimen the bone flap was removed at a distance from the original source of infection after two other bone flaps had been removed and the case had been running a much longer time than the first one. In this second specimen there was actual abscess formation in the marrow spaces near the necrotic area in the center of the bone flap. There were a few scattered abscesses in other parts of the bone, but the predominating picture was that of fibrosis of the marrow spaces.

On the inner surface of the bone flap there was a longer and larger layer of new bone. Through this many infected vessels ran to the dural surface. Again there was an infected blood clot between the dura and the bone, and the vessels in the fibrous tissue that connected the dura and the under surface of the skull were often infected. Again the impression was that the greater current of the infection was inward. The extensive fibrosis of the marrow spaces suggested that the infection for the greater part had been conquered and walled off except along the track of the infected vein which led to the necrotic perforation in the center of the bone flap. Infection was found to extend to the edge of the bone in all directions.

The first specimen, therefore, shows the acute fulminating type of infection and the second shows bone in which the infection had cleared up for the most part and the marrow spaces had been obliterated by fibrous tissue. The main channel by which the infection spread in the second specimen was by way of a diploetic vein.

CONCLUSIONS

It is obvious that I am not reporting these three cases as favorable results, because two of the patients died. My purpose in reviewing them is to record a number of facts which I learned from them. Also, reporting the cases gives me an opportunity after a silence of three years to say my say again on the subject of osteomyelitis. Three years, I maintain, is a modest and commendable period of silence. Others of my audience might well imitate me in this respect. In reviewing all the cases which we have had at the infirmary, especially those of the past five years, our operative results have been progressively better, and better in direct proportion as the operations performed were systematic and radical.

I feel even more strongly than I did in my original paper of three years ago that the edema of the skin of the forehead is a rough guide to the extent of the bone and periosteal infection. Further, as was pointed out in that paper, if there is actual bone necrosis the bone is infected without necrosis for an inch to an inch and a half beyond the necrotic area. Bone necrosis does not occur until seven to ten days after the pitting edema appears, and the x-ray is not positive until necrosis appears. Examination of the bone specimen removed in two of the cases just reported showed that the infection spreads along the inner surface of the bone, as well as by the diploic veins. When the infection spreads by way of a diploic vein it may localize at a point far from the original source of infection. When it does so localize, the pus tends to work both inward and outward, giving either a subperiosteal abscess or an extradural abscess, or both, with a destruction of the bone between the two. When a case has lasted two or three weeks, the operator should expect to find one or both of these conditions.

The histologic examination of my specimens shows in addition that the infection may spread by way of an inner layer of new bone which is formed between the skull and the dura. The small veins which run in the new bone are often infected and there are numerous hemorrhagic clots which also are infected. Further, the infection spreads by way of the fibrous tissue which covers the new bone and which binds the inner surface of the skull to the dura.

The operator who is doing his first operation on osteomyelitis of the skull should expect extradural abscesses as a matter of course. In fact, he should expect more than this; he should be on the lookout for a subdural abscess or a brain abscess. The brain abscess, if present, is usually found later or comes later as a complication, but it is always round the corner, and should be watched for even at the first operation.

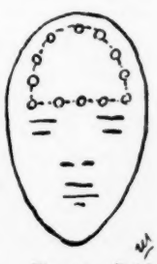


Fig. 16.—Drill holes for removing the frontal bone in one piece.

The more I see of osteomyelitis of the frontal bone, the more I feel that the whole face of the frontal bone should be removed as a routine from the hairline to the eyebrow. Preferably, it should be removed in one piece. However, if the patient is in poor condition and there is an area of necrosis, it is justifiable to work from the necrotic area outward, removing the bone for an inch to an inch and a half in all directions from the necrotic area. I believe further that both frontal sinuses should be opened, and the anterior and posterior walls of each sinus removed. I feel strongly that the lateral limit of the bone flap on each side should be at least the outer angle of each frontal sinus or, better, the outer angular process of the frontal bone on each side. The objection to this extensive removal is the deformity. It has been proved that fully 90 per cent of this can be corrected by modern plastic surgery. Therefore the surgeon should not allow his hand to be halted by the question of deformity. If he does he will lose most of his cases of osteomyelitis of the skull.

828 Beacon Street.

ABSTRACT OF DISCUSSION

DR. ERNEST SACHS, St. Louis: I have had the opportunity of seeing a good many cases of osteomyelitis of the skull in the last twenty-five years, and the one conclusion that I have come to is that the best way of treating them is to be conservative. Drain the superficial abscess and wait for the skull to sequestrate and then remove the sequestrums. I am sorry that I have to disagree with Dr. Mosher, but in my experience the cases in which large fragments of bone have been removed have been the cases that have ended, as a rule, disastrously, just as his have. The most common complication of osteomyelitis of the skull is a brain abscess. One of the things about which neurologic surgeons feel very strongly is that in dealing with brain abscesses in the presence of an infected skull, whether it is the mastoid or the frontal region, it is extremely important to drain the abscess through a clean field and not to go through an infected field. I believe the principle of going through an infected area is not sound surgery. One should go through a potentially clean area. That may be an extremely difficult undertaking when an extensive osteomyelitis is present, it may be occasionally even impossible. But if the conservative method is used and healthy areas of bone are not opened but sequestrums are allowed to separate and then removed, the field is gradually cleaned up, and better results will be obtained.

DR. JOHN J. SHEA, Memphis: In the *Laryngoscope* (**43**:153 [March] 1933) Mosher and Judd presented a valuable contribution on osteomyelitis, in which they delineated its pathology. The authors felt that the edema of the skin and the soft tissues of the forehead roughly furnished a practical guide to the extent of the bone infected and the limits necessary to be removed. Today Mosher's paper on the clinical aspect of three cases demands a thorough study of the manuscript in order to learn the many lessons that it contains. Osteomyelitis of the frontal bone is a progressive disease and its surgery must be timely and radical. Formerly it was a fatal condition, but, with better cranial surgery and the utilization of immunization, successful cases are constantly being reported. If a census should be taken of this audience, many cases never published would be reported. The bacteriology of osteomyelitis of the frontal bones is the same as osteomyelitis of the long bones. The severe complication may follow any operation, simple or radical, a suppurating sinus, or may occur spontaneously with or without trauma. Usually it occurs whenever the diploe has been opened and exposed to an infection against which sufficient immunity has not been established. The diploe of the frontal bone is spacious in the growing skull, which explains the rapidity of its spread in young adults. The earlier the osteomyelitis occurs after an operation or injury, the more likely is it to be serious and rapid in its destruction. I agree with Dr. Mosher that roentgenologic studies are misleading, for the pathologic changes are more advanced than revealed in the films. Dr. Mosher calls attention to the frequency of extradural abscesses. In two cases presented to the Southern Section of the American Laryngological, Rhinological and Otological Society in 1928, I called attention to the tendency of the infection to travel upward to the site of the anterior fontanel and then extend inward to form an extradural abscess. The operative procedures are carried out with greater ease under local than under general anesthesia.

DR. O. JASON DIXON, Kansas City, Mo.: The knowledge that this was a serious disease and that other men before me failed prompted me to try a more or less cowardly procedure. To my surprise I found that by not operating I got better results. I watched these patients go away and come back in a year, some of them in two years and under a local anesthetic have a small sequestrum removed. The radical procedure is a very frank admission of the lack of understanding of the true nature of the disease. Not much is known about the pathology of osteomyelitis of the skull. Certainly thrombosis is nature's protective mechanism against the systemic spread of an infection and is not always a fatal or a bad sign. By no means is it an indication of necrosis. Pricking one's finger with a splinter never killed anybody because the splinter was left in. It kills from the onset with the spread of the phlebitis and the reaction that occurs immediately following the onset of the injury. If one does not succumb, the foreign body may stay in for weeks or months or years without any harm. Physicians must have the patience to stand by and help the patient a little. I am convinced that it is unfair to criticize anything about this procedure unless one takes the entire responsibility, and to be a good critic one must be bold enough to go ahead and handle the entire problem. As Dr. Sachs so well emphasized, the brain abscess is the major problem. The patient must be viewed as a whole and not through a microscope or a slide or the x-ray film. Fortunately for me, I did not diagnose my early cases early because I didn't think about it and I didn't get the x-ray picture. It is just as well not to find out the diagnosis early. Swimming is the chief etiologic factor. I have had so many cases from Pittsburg, Kan., due to swimming in the strippet mines that there must be something to that. Trauma plus infection is the major factor. The physician must have the courage to stand by and support the patient and let him fight his first infection and then to remove the sequestrums as they occur, preferably under local anesthesia.

DR. JOSEPH E. J. KING, New York: I favor the opinions expressed by Dr. Mosher regarding the complete extirpation of the involved bone in osteomyelitis of the skull. I did not know that the conservative removal of sequestrums was advocated by any one. Drs. Mosher, Furstenberg, Naffziger, Fincher and others have reported series of successful results after complete extirpation. I have had about eight such cases at Bellevue Hospital, the Manhattan Eye, Ear and Throat Hispital, and the Jersey City Medical Center. Furstenberg states that regeneration of bone takes place between the dura and the pericranium in about two years and fills the cranial defect so that a cranioplasty is not necessary. Naffziger told me that he has removed a block of involved skull *en masse* and has later reinserted the piece of skull, which remains intact and takes well. Before knowing of Naffziger's work I removed a rather large piece of involved bone from the left parieto-occipital region in a case of metastatic osteomyelitis secondary to a lung abscess. As yet the piece has not been reinserted for the reason that a sufficient amount of bone was not removed and the infection extended around the patient's head, requiring more operations. At the present time an enormous amount of bone has been removed but the patient is perfectly well, is up and about the hospital, and works in the ward. I am inclined to agree with the speaker who stated that some cases of osteomyelitis of the frontal bone result from certain types of operative procedures done on the frontal sinus. Nevertheless, when these cases occur I think the best results will be obtained from complete extirpation of the infected bone. I turn down a scalp flap with all the soft parts, exposing the skull. The portion involved is completely removed and the frontal sinus is cleaned out. Gauze packings wet in diluted solution of sodium hypochlorite or a solution of azochloramid are placed over the dura, and the scalp flap is returned to its position and loosely sutured. Instillation of the solution is done for six days, at which time under tribrom-ethanol anesthesia the gauze is removed and replaced and again taken out on the tenth day. The flap is again returned to its position and sutured, an opening being left for packing the frontal sinus. These cases have recovered nicely. I therefore am heartily in accord with the opinions of Drs. Mosher, Naffziger and Furstenberg.

DR. HARRIS P. MOSHER, Boston: I never expected a neurologic surgeon to agree with me. He is decided in his opinion, and I am decided in mine, and I will let time settle who is right. Dr. King has put the idea as I should like to have it put. He does a more extensive operation than I ever dared to do, not any more extensive however, than Furstenberg has done. The latter is one of the foremost of the brain surgeons of this country. His support is all that I ask. I rest my case with this statement: Until we began a systematic and a thorough operation and clung to conservative treatment, we had very disappointing results. It is only since we have reversed our steps that we have begun to get results which were in any way satisfactory. They can be better. Some men seem to feel that their results are all that possibly could be desired, but I respectfully doubt it.

Canned and Raw Fruits.—In canned grapefruit and in canned tomatoes the high vitamin C value is excellently conserved. These, therefore, rank along with the raw citrus fruits and their juices among the richest sources of vitamin C. Not far below them in this respect are raw ripe bananas and some varieties of apples.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

PERITONITIS DUE TO BILE AND TO LIVER AUTOLYSIS

HENRY N. HARKINS, M.D., PH.D.
PAUL H. HARMON, M.D., PH.D.
AND
JEANNE E. HUDSON, S.B.
CHICAGO

Bile peritonitis is a clinical entity due to the action of escaped bile on the peritoneal surfaces that is probably more common than has been realized. Eliason and McLaughlin [1] report that perforation of the gallbladder occurs in from 1 to 3 per cent of all cases of biliary disease. These figures were based on a study of more than 7,000 cases of gallbladder disease. It has also been recognized [2] that bile peritonitis may occur in the absence of demonstrable perforation of the biliary system.

Once the importance of this hitherto rarely recognized condition was demonstrated, numerous experimental studies on the mechanism of death in bile peritonitis were made. These observations include the work of Horrall and others [3] and center chiefly around the postulates that toxic action and anaerobic bacterial invasion are the chief two lethal factors in bile peritonitis. From other data [4] similarly obtained by experiment, we have advanced the idea that secondary shock (in the sense of decrease in volume of circulating fluid) is one of the most important lethal factors in this condition. We fully recognize that there are substantial differences between experimental and human bile peritonitis. However, since the theories of the previous workers were obtained by experiment, refutation of these theories might come from similar experiments. It is after this that application of the theories to patients can be made.

No attempt will be made at this time to present proof against the toxic or bacterial theories of death in bile peritonitis, but a brief outline will be given of the positive evidences for the rôle of secondary shock in this condition. The presence of secondary shock is significant because its therapeutic implications are clear.

Dogs under general anesthesia were used in all experiments. The peritonitis was produced by the intraperitoneal injection of usually 5 cc. per kilogram of body weight of either 10 per cent bile salt solution or whole gallbladder bile. The animals were then observed until death, a matter of usually five to twenty-three hours later.

The most striking result of the biliary action was a gradual but profound lowering of blood pressure (chart 1) with a markedly lowered bleeding volume. Accompanying this fall in blood pressure was a marked concentration of blood in all of thirty-two dogs observed, and in three instances the hemoglobin rose to the extreme values of 177, 178 and 190 per cent respectively. Hematocrit determinations were proportionately elevated. Increase in the blood nonprotein nitrogen content was found in agreement with that previously reported by Ziegler and Orr [5] and others. Haden and Orr [5] had previously found that autolyzing liver in the abdominal cavity produces no change in the blood chlorides even with a very great increase in the urea and nonprotein nitrogen.

As the peritonitis developed there was an enormous effusion of blood-stained fluid into the peritoneal cavity. This fluid was not a mere transudate but clotted spontaneously and was shown to be chemically similar to blood plasma in total protein, sugar, sodium chloride and nonprotein nitrogen content. For example, in one typical experiment the blood plasma protein was 6.3 Gm. per hundred cubic centimeters and the fluid protein 5.7 Gm. In twenty-seven experiments the amount of this peritoneal fluid averaged 2.5 per cent of the body weight, which corresponds to 250 cc. in a 10 Kg. dog and in turn to 33 per cent of the blood volume and to approximately 60 per cent of the plasma volume. It was assumed that this outflow of plasma-like fluid accounts for a large part of the blood concentration with increased hemoglobin percentage and hematocrit reading, for the decreased bleeding volume and for the marked fall in blood pressure. Blalock [6] Parsons and Phemister [7] and others have shown that a somewhat similar loss in burns, trauma to an extremity, intestinal manipulation, hemorrhage, plasmapheresis and other conditions is sufficient to cause death. The same evidence indicates its importance in the production of secondary shock and the resultant death in bile peritonitis.

Since the aforementioned work indicated that secondary shock might be an important lethal factor in bile peritonitis, it was thought that it might likewise be significant in death due to intraperitoneal insertion of tissues (so-called tissue autolysis in vivo). The clinical importance of tissue autolysis is especially to be considered when ligating large bits of tissue in producing hemostasis in surgical operations.

LITERATURE ON LIVER AUTOLYSIS [8]

Mann [9] noted that, if in the performance of a hepatectomy a small amount of liver was left in the abdomen, the animal was more apt to die than when the liver was completely removed. Mason and his associates [10] extended the work of Mann. These authors in their first experiments on dogs replaced an excised portion of liver in the same animal and showed that there was a marked decrease in plasma volume. At postmortem examination they found that the peritoneal

From the Department of Surgery and the Douglas Smith Foundation, the University of Chicago.
Read before the Section on Pathology and Physiology at the Eighty-Seventh Annual Session of the American Medical Association, Kansas City, Mo., May 13, 1936.

1. Eliason, E. L., and McLaughlin, C. W.: Perforation of the Gallbladder, Ann. Surg. **99:** 914-921 (June) 1934.

2. Clairmont, P., and von Haberer, H.: Gallige Peritonitis ohne Perforation der Gallenwege, Mitt. a. d. Grenzgebiet. d. Med. u. Chir. **22:** 154-158, 1911.

3. Horrall, O. H.: Experimental Bile Peritonitis and Its Treatment in the Dog, Arch. Int. Med. **43:** 114-128 (Jan.) 1929; The Toxicity of Bile, Phys. Rev. **11:** 122 (April) 1931. Andrews, Edmund; Rewbridge, A. G., and Hrdina, Leo: Causation of Bacillus Welchii Infections in Dogs by Injection of Sterile Liver Extracts or Bile Salts, Surg., Gynec. & Obst. **53:** 176-181 (Aug.) 1931; Causation of B. Welchii Infection in Dogs with Sterile Liver Extract and Bile Salts, Proc. Soc. Exper. Biol. & Med. **28:** 136-137 (Nov.) 1930. Ellis, J. C., and Dragstedt, L. R.: Liver Autolysis in Vivo, Arch. Surg. **20:** 8-16 (Jan.) 1930.

4. Harkins, H. N.; Harmon, P. H.; Hudson, Jeanne, and Andrews, E.: Mechanism of Death in Bile Peritonitis, Proc. Soc. Exper. Biol. & Med. **32:** 691-693 (Feb.) 1935. Harkins, H. N.; Harmon, P. H., and Hudson, Jeanne: Lethal Factors in Bile Peritonitis: I. "Surgical Shock," to be published.

5. Ziegler, A. M., and Orr, T. G.: Chemical Changes in the Blood of the Dog in Experimental Bile Peritonitis, J. Exper. Med. **53:** 865-868 (June) 1931. Haden, R. L., and Orr, T. G.: The Blood Chlorides in Proteose Intoxication, ibid. **48:** 639-645 (Nov.) 1928.

6. Blalock, Alfred: Experimental Shock: The Cause of the Low Blood Pressure Produced by Muscle Injury, Arch. Surg. **20:** 959-996 (June) 1930.

7. Parsons, Eloise, and Phemister, D. B.: Hemorrhage and "Shock" in Traumatized Limbs, Surg., Gynec. & Obst. **51:** 196 (Aug.) 1930.

8. The term autolysis is applied rather loosely here in accordance with recent usage. As Reeves and Martin (The Rôle of Bacteria in Autolysing Tissue, J. Bact. **31:** 191-202 [Feb.] 1936) point out, since in most instances the breakdown of liver is accompanied by bacterial decomposition it hence is not strictly autolysis. The recent articles of Klump in THE JOURNAL and others take no account of this bacterial factor.

9. Mann, F. C., cited by Mason.[10]

10. Mason, E. C., and Davidson, E. C.: A Study of Tissue Autolysis in Vivo: I. Blood Changes: Physical and Chemical, J. Lab. & Clin. Med. **10:** 622-630 (May) 1925.

cavity usually contained from 100 to 300 cc. of brown fibrin-flecked fluid. This fluid contained a considerable amount of nonprotein nitrogen, but they did not report any analysis for total protein content. When injected intravenously into other animals the abdominal fluid was much less toxic than saline extracts of autolysed liver.[11] These authors[12] also reported that, when the spleen was separated from its blood supply and left free in the peritoneal cavity, death occurred in 50 per cent of the animals studied and was accompanied by an outpouring of fluid into the peritoneal cavity similar to that found in liver autolysis. In general, spleen acted similarly to liver but did not produce death so easily or so soon.

Wangensteen and Waldron[13] also performed experiments on autolysis of intestine, liver, spleen, muscle and other tissues. After intraperitoneal insertion of these tissues the authors found 300 or 400 cc. of serosanguineous fluid in the peritoneal cavity. The peritoneal surfaces were reddened and gas was often found. No mention of anaerobic cultures was made. They found that spleen was less lethal than liver, and the animals suffering from the action of spleen could sometimes be kept alive by subcutaneous administration of saline solution.

Dragstedt and his associates[14] began work on autolysis of intestinal loops separated from their blood supply and reported that the in vivo autolysis of short isolated sections of intestine that had been sterilized by prolonged drainage into the peritoneal cavity did not produce any serious effect in dogs. When such segments were infected, however, death followed shortly after the occlusion of their blood supply. Ellis and Dragstedt[15] later performed experiments on liver autolysis. They reported that the uncontaminated liver of a normal healthy adult dog regularly contains a gram-positive anaerobic bacillus and concluded that this organism probably forms exceedingly poisonous substances when permitted to grow in dead liver, and that it is the absorption of these poisons from the peritoneal cavity that causes death in in vivo liver autolysis. They furthermore reported that fetal liver, proved sterile by culture, does not produce any toxic effect.

Andrews and his associates[16] performed experiments that differed from those of Dragstedt in one important respect. Whereas the latter had found that sterile autoclaved liver was nontoxic, Andrews reported that if such sterile liver was ground into fine bits it produced an autolytic peritonitis accompanied by gas forming organisms similar to that produced by fresh liver. Andrews also reported that muscle or bile salts would produce a similar fatal peritonitis.

Later work of Mason[17] again called attention to the extensive loss of fluid in these experiments, especially into the peritoneal cavity. The large amount of peritoneal exudate had also been noted by Dragstedt and by Andrews. Mason and his collaborators believed that irritative substances liberated from the autolysing liver cause a chemical peritonitis with increased permeability of the peritoneal surface. This results in passage of both bacteria and fluid into the peritoneal cavity. They further believed that the fluid loss is sufficient to cause circulatory disturbances but that the failure of fluid administration to prolong life was due to the enormous increase in permeability of the abdominal viscera.

Trusler, Reeves and Martin[18] in a series of papers made a special study of the anaerobic bacteria found in experimental liver autolysis and bile peritonitis. These organisms did not produce exotoxins and were similar to those recovered from normal dog liver and muscle. The authors did not classify them as Clostridium Welchii. They found that sterile autoclaved liver or bile salts did not cause invasion of the peritoneal cavity by anaerobic organisms if contamination by touching the muscles of the abdominal wall during the process of insertion was avoided. These authors noted that the various incubated preparations of liver and sterile bile salts cause an intense irritation of the peritoneal sur-

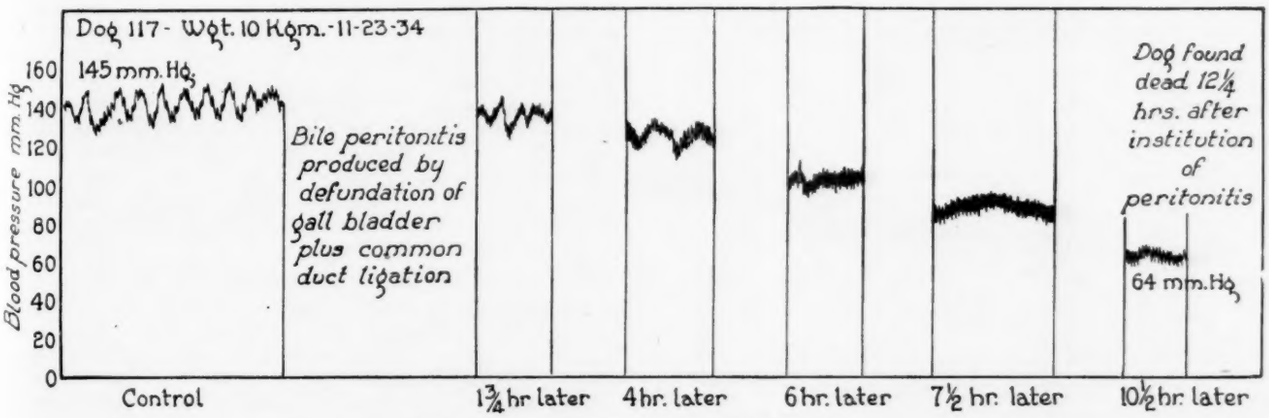


Chart 1.—Blood pressure changes in bile peritonitis.

11. Mason, E. C., and Lemon, C. W.: Autointoxication and Shock Surg., Gynec. & Obst. **53**: 60-64 (July) 1931. Mason, E. C., and Davidson, E. C.: A Study of Tissue Autolysis in Vivo: II. A Pharmacological Study of the Toxic Material, J. Lab. & Clin. Med. **10**: 906-913 (Aug.) 1925. Mason, E. C., and Nau, C. A.: The Causes of Death Due to Liver Autolysis, Surg., Gynec. & Obst. **60**: 769-774 (April) 1935.

12. Mason, E. C.; Davidson, E. C., and Matthew, C. W.: A Study of Tissue Autolysis in Vivo: III. Observations Using the Spleen, J. Lab. & Clin. Med. **10**: 997-999 (Sept.) 1925.

13. Wangensteen, O. H., and Waldron, G. W.: Studies in Intestinal Obstruction: IV. Strangulation Obstruction: A Comparison of the Toxicity of the Intestine and Other Tissues Autolyzed in Vivo and in Vitro, Arch. Surg. **17**: 430-439 (Sept.) 1928.

14. Dragstedt, L. R.; Moorhead, J. J., and Burcky, F. W.: Intestinal Obstruction: An Experimental Study of the Intoxication in Closed Intestinal Loops, J. Exper. Med. **25**: 421-439 (March) 1917.

15. Ellis, J. C., and Dragstedt, L. R.: Effect of Liver Autolysis in Vivo, Proc. Soc. Exper. Biol. & Med. **26**: 304-305 (Jan.) 1929.

16. Andrews, Edmund, and Hrdina, Leo: Liver Autolysis in Vivo, Proc. Soc. Exper. Biol. & Med. **27**: 987-988 (June) 1930; The Cause of Death in Liver Autolysis, Surg., Gynec. & Obst. **52**: 61-66 (Jan.) 1931.

17. Mason, E. C., and Lemon, C. W.: Anhydremia as a Possible Cause of Death in Liver Autolysis, Surg., Gynec. & Obst. **55**: 427-431 (Oct.) 1932.

18. Trusler, H. M.; Reeves, J. R., and Martin, H. E.: Significance of Anaerobic Organisms in Peritonitis Due to Liver Autolysis, Arch. Surg. **30**: 371-393 (March) 1935. Trusler, H. M., and Reeves, J. R.: Significance of Anaerobic Organisms in Peritonitis Due to Liver Autolysis; Bacterial Flora of the Liver and Muscle of Normal Dogs, Arch. Surg. **28**: 479-491 (March) 1934.

faces with much extravasation of blood and fluids, and they believed the death of the dog to be associated with shock.

EXPERIMENTAL

To obtain more exactly quantitative measurements of fluid loss and blood concentration than were obtained by previous workers whose chief interest was in the bacterial or toxic manifestations of tissue autolysis, many of their experiments were repeated. As an

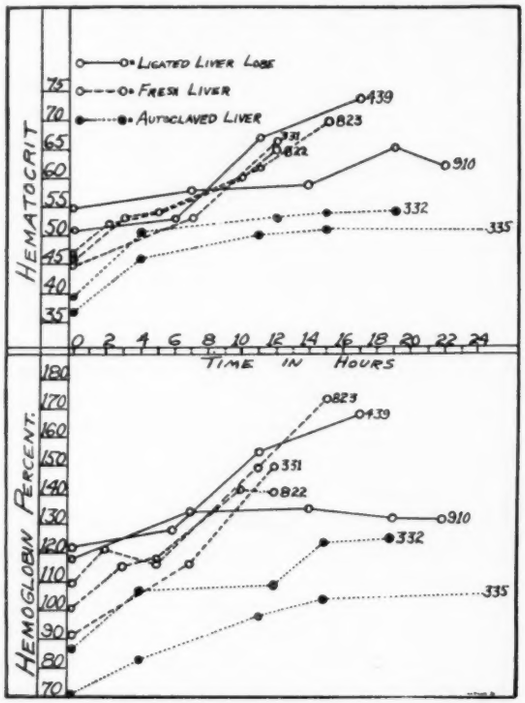


Chart 2.—Blood concentration in peritonitis due to liver autolysis. The figures on animal 302, which recovered, are omitted.

example of the need of such repetition, Trusler, Reeves and Martin[18] state that at necropsy five hours after insertion of autoclaved liver in the peritoneal cavity of dog 849 they found 300 cc. of bloody fluid in the peritoneal cavity. Since they do not give the weight of the dog or protein analysis of the fluid no definite idea of the importance of the 300 cc. can be gained. Our first experiment included ligation of the left paramedian lobe of the liver:

EXPERIMENT 1.—*Ligation of lobe of liver with autolysis of ligated lobe and resultant death.* Two dogs were anesthetized with morphine and atropine and ether. Control readings of the hematocrit (Van Allen) and hemoglobin percentage (Sahli) were made. Then through a midline fascia splitting incision with aseptic technic throughout and avoiding touching of the abdominal muscles, the left paramedian lobe of the liver was ligated in situ at its base with a double linen ligature. The abdomen was then closed and further hematocrit and hemoglobin readings were taken until death. The animals died after an average of twenty hours with slight hemoconcentration in one instance and marked in the other (chart 2). The peritoneal exudate found at death averaged 2.6 per cent of the body weight. The peritoneal fluid recovered at necropsy was blood tinged and somewhat similar to blood plasma in chemical composition, as shown in the table.

The protein content of the fluid may be partly accounted for by degenerated tissue proteins from the implant, but the fact that most of the samples clotted spontaneously indicates the presence of considerable blood protein. The loss of fluid that is plasma-like in composition is naturally of more serious import than loss of a similar amount of mere transudate. Histologic examinations of tissues removed were somewhat similar in this and in the following experiments and hence are described together. Changes include hemorrhages and vascular engorgement in the subserosa and submucosa of the intestine. Hemorrhage in the tips of the rugae in the intestine was noteworthy in several instances. Engorgement of the vessels of the mesenteric glands, liver, spleen and lungs and in the reticular and fascicular zones of the adrenal glands was frequent, with occasional chromatolysis in the same regions.

Anaerobic cultures made in these experiments will now be discussed together. The fresh liver and spleen implants contained a gram-positive anaerobic bacillus, while the muscle implants and all autoclaved specimens were sterile. At necropsy all the dogs used contained gram-positive anaerobic bacilli either in the peritoneal exudate or in the subcutaneous implant, as done in experiment 6.

EXPERIMENT 2-a.—*Peritonitis and death produced by the intraperitoneal insertion of fresh liver.* Under aseptic technic throughout, a large portion of liver was removed from a dog ten minutes after electrocution, cut into small pieces and ground with a sterile mortar and pestle without sand. A gram-positive anaerobic bacillus was cultured from samples of this material before implantation. One hundred grams of the ground material was inserted in the peritoneal cavity of each of three dogs. The animals died after an average of thirteen hours, with marked hemoconcentration (e. g., rise in hemoglobin percentage from 110 to 173 and hematocrit reading from 47 to 70 in dog 823). The peritoneal exudate found at death averaged 2.6 per cent of the body weight.

EXPERIMENT 2-B.—*Blood pressure fall and bleeding volume in peritonitis due to liver autolysis.* Fresh liver was implanted into two dogs in a manner identical to that used in experiment 2-a except that no cultures were made, the dogs were under sodium barbital anesthesia and a continuous blood pressure reading was taken by means of a cannula in the carotid artery connected with a mercury manometer. Except for this experiment, all others were done under morphine and atropine and ether anesthesia. The animals were killed by bleeding after

Chemical Analysis of Peritoneal Exudate

Dog	Type of Experiment	Total Protein, Gm. per 100 Cc.	Albumin, Gm. per 100 Cc.	Globulin, Gm. per 100 Cc.	A/G Ratio	Nonprotein Nitrogen, Mg. per 100 Cc.	Sugar, Mg. per 100 Cc.	Sodium Chloride, Mg. per 100 Cc.
822	Fresh liver intraperitoneal implant	4.3	2.5	1.7	1.4	118	trace?	494
823	Fresh liver intraperitoneal implant	5.0	3.7	1.4	2.7	88	trace?	583
331	Fresh liver intraperitoneal implant	6.0	4.5	0.9	5.1	104	0	627
335	Autoclaved liver intraperitoneal implant	5.5	4.1	0.9	4.6	109	0	496
326	Fresh spleen intraperitoneal injection	6.0	4.7	1.1	4.3	109	0	626
910	Liver lobe ligation.....	...	...	...	...	146	73	578
439	Liver lobe ligation.....	7.6	6.4	0.8	8.6	71	83	565
45	Human bile intraperitoneal injection	5.8	3.6	2.1	0.15	82	29	620

an average of fifteen hours with little hemoconcentration in one instance and marked in the other. The blood pressure gradually fell in both instances, as shown in chart 3. The bleeding volume averaged 2.2 per cent of the body weight, which is similar to that found in secondary shock due to other causes.[4]

The effect of fresh liver seemed to indicate the production of secondary shock with low blood pressure, lowered bleeding volume, significant plasma loss into the peritoneal cavity and marked hemoconcentration in

all but one instance. In two of the animals definite gas was present in the intraperitoneal tissues, and in all instances gram-positive anaerobic bacilli were found on culture. This indicates that both secondary shock and the effects of infection are to be considered as responsible for death in these animals. If, however, as Trusler, Reeves and Martin [18] postulate, the dog's anaerobic organisms produce no exotoxins, it would seem unlikely that the small amount of infection produced by these organisms would cause death while much more extensive infection by definite pathogenic anaerobes in human beings would not do so as quickly. The absorption of toxic products from the decomposed liver is to be considered, therefore, as an additional lethal factor.

EXPERIMENT 3.—*Peritonitis and death produced by the intraperitoneal insertion of fresh muscle.* Fresh muscle obtained sterilely from a dog's thigh was chopped up and ground and then 100 Gm. implanted in the peritoneal cavity of each of two animals by the technic of experiment 2-a. Death occurred in nine and twelve hours. There was very little hemoconcentration and very little fluid found in the peritoneal cavity at necropsy. The spleen was sterilely removed from two dogs and cut and ground. This mash was then implanted into the peritoneal cavity of one of the two splenectomized dogs. This animal (dog 326) died after seven hours with rather marked hemoconcentration (hemoglobin rise from 118 to 158, hematocrit rise from 50 to 69), but with little peritoneal exudate.

This experiment indicates that death may occur in fresh tissue autolysis in the absence of either local fluid loss or of generalized blood concentration. Moon and Kennedy [19] reported concentration of the blood following intraperitoneal insertion of muscle fragments with an increase of almost 3 million in the red count in one instance.

EXPERIMENT 4.—*Peritonitis produced by the intraperitoneal insertion of autoclaved liver.* One hundred grams of autoclaved liver mash was implanted intraperitoneally with similar technic in each of three dogs. Autoclaving was done for twenty minutes at 20 pounds pressure and afterward aerobic and anaerobic cultures showed the liver to be sterile. Hemoconcentration was much slighter than when fresh liver was used, death occurred later (average of thirty hours in two instances, recovery in the third) and there was relatively little peritoneal exudate.

Some other cause of death than local fluid loss was active in these animals. At necropsy there was no gas and the liver was not blown up or markedly discolored as in the typical autolytic peritonitis described by Andrews.[16] Although gram-positive anaerobic bacilli were found in both animals that died, no gross signs of infection were present.

EXPERIMENT 5.—*Peritonitis and death produced by the intraperitoneal insertion of incubated muscle.* A quantity of dog muscle was incubated at 37 C. with Bacillus sporogenes and another quantity with Clostridium Welchii for thirty-six hours. They were then autoclaved for twenty minutes at 20 pounds pressure. The resultant semiliquid soupy mash was in each case sterile on culture and 150 Gm. of each was placed intraperitoneally in two dogs. The muscle that was incubated with Bacillus sporogenes produced marked hemoconcentration and death in seven hours, but only 200 cc. of spontaneously clotting peritoneal fluid (which included the remains of the semiliquid muscle implant). This animal was the only one in the entire series definitely known to have died in convulsions. Necropsy revealed moderate hemorrhages in the peritoneal surfaces, mesenteric glands, duodenum, jejunum and part of the ileum. There were no hemorrhages in the adrenal glands and no edema of the dependent portions of the back. There was slight edema of the lungs. The muscle that had been incubated with Clostridium Welchii produced marked hemoconcentration, death in eighteen hours and only 110 cc. of nonclotting bloody peritoneal fluid. Necropsy revealed marked hemorrhages in all the peritoneal surfaces, duodenum, adrenals, mesenteric glands and lungs. There was marked edema of the dependent portions of the back.

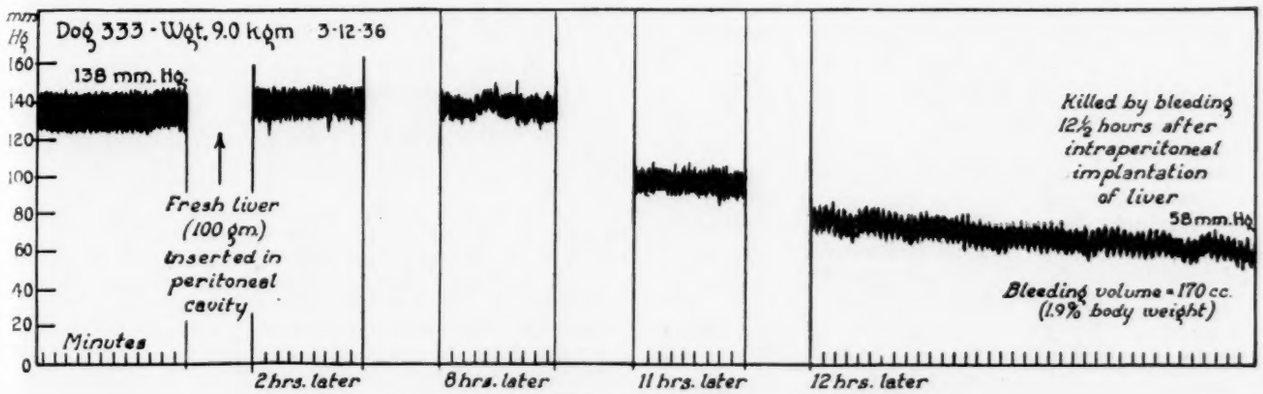


Chart 3.—Blood pressure changes in peritonitis due to liver autolysis.

While the marked hemoconcentration in these two animals indicated a possible plasma loss from the blood stream, there was no proportionate loss into the peritoneal cavity. The only indications of loss elsewhere were the localized hemorrhagic changes and the dependent edema of the second dog. However, it seems quite probable that fluid loss with secondary shock was not the chief factor in the death of these animals. Exotoxins produced by the action of the anaerobic organisms may have been a factor, as stock cultures of known toxin-producing strains were used. This would not necessarily apply to the autolysis or incubation of tissue in the other experiments, for in them the gram-positive anaerobic bacilli were from dog tissues, which according to Trusler and his associates do not produce exotoxins.

EXPERIMENT 6.—*Subcutaneous implantation of liver with resultant death.* Autoclaved liver mash was placed subcutaneously in the axilla and groin of one side of each of three dogs, two of the specimens having been previously incubated for at least six hours. Hemoconcentration was appreciable in only one of the three animals and death occurred after twenty, twenty-three and seven hours respectively. The dorsal and ventral midlines of the animals having been previously marked, bisection was done and the difference in weight of the two sides (corrected for the amount of liver inserted) averaged 2.3 per cent of the

19. Moon, V. H., and Kennedy, P. J.: Pathology of Shock, Arch. Path. **14**: 360-371 (Sept.) 1932; Changes in Blood Concentration Incident to Shock, J. Lab. & Clin. Med. **19**: 295 (Dec.) 1933.

body weight. However, the dog which died the most rapidly had the smallest amount of local fluid loss and dissection revealed no edema. Necropsy of these animals showed hemorrhagic changes in the adrenals, mesenteric glands and to a less extent in the intestine.

While fluid loss may thus be a factor in death from subcutaneous implantation of liver, it does not seem to occur invariably. This is in marked contradistinction to the effects of subcutaneous bile salt injection, in which death of the experimental animals was almost invariably associated with a marked local fluid loss.

COMMENT

While extensive loss of plasma-like fluid into the peritoneal cavity seems to be a lethal factor of importance in experimental bile peritonitis, the evidence that such is the case in death due to experimental implantation of liver in the peritoneal cavity is not only inconclusive but instead seems to point toward other causes. In experimental bile peritonitis, gram-positive anaerobic bacilli were found in only a small proportion of cases and then usually as either late or postmortem invaders. In peritonitis following liver implantation, on the other hand, such organisms were found in all instances. It is quite possible that these organisms act chiefly in breaking up the liver or other tissue into toxic substances. Such action may be chemical in producing toxic proteose-like substances or may be merely mechanical with disruption of the tissue into finer particles, as the result of the explosive action of the gas. When broken up into such particles the action may be partly that of a local irritant producing some local fluid loss and partly that of a general toxic agent. In addition, some of these substances may give rise to a generalized increased permeability of the vascular system with a generalized loss of circulating blood fluid. It is only by considering these factors working simultaneously that a complete picture of the mechanism of death due to liver implantation can be drawn. At the present time it seems unwise to say that one of these factors is the only element of importance or even the chief instrument of death. These causes may work coordinately in bile peritonitis as well, but in the latter the local irritating effect of the bile produces such a regional outpouring of fluid that the factor of secondary shock outweighs and overshadows the rest. In liver autolysis, on the other hand, the less irritating broken-down liver juices may produce a general toxic action out of proportion to the local fluid loss before the latter has reached dangerous proportions.

While certain of these experiments, especially those on bile peritonitis, indicate that there is such a thing as irritative peritonitis in which local fluid loss may be a lethal factor of importance, the exact cause of death in all instances is not clear. The peritoneal cavity in liver autolysis experiments contains a vicious mixture of irritant, foreign body, bacteria and injured tissues of the host. To say that there is one cause of death in such a case is difficult. At least it is brought to attention that fragments of foreign or devitalized parenchymatous tissues should not be left in patients.

SUMMARY AND CONCLUSIONS

1. At least five possible lethal factors in experimental peritonitis due to bile or to implanted liver may be active, including (*a*) local irritant action of the foreign substance producing local plasma loss and secondary shock; (*b*) local damage to body tissues with absorption of toxic products thereby produced; (*c*) absorption of toxic products from the foreign substance itself; (*d*) absorption of exotoxins produced by anaerobic organisms or of toxic products produced by the action of these organisms on the foreign substance present or the body tissues themselves, and (*e*) action of absorbed products on general vascular permeability furthering secondary shock.

2. The first of these factors, i. e., producing local plasma loss and secondary shock, seems to be of relatively greater importance in bile peritonitis than in peritonitis due to implanted liver. In the treatment of bile peritonitis attention should be directed against the possible presence of secondary shock.

950 East Fifty-Ninth Street.

ABSTRACT OF DISCUSSION

DR. THOMAS G. ORR, Kansas City, Mo.: In clinical medicine the important question is whether or not bile in the free peritoneal cavity will cause peritonitis. Some writers have expressed the opinion that bile does little damage to the peritoneum unless infected. Both experimental and clinical observations indicate that the effect of sterile bile within the peritoneal cavity varies directly with the quantity of bile. This was definitely true in a series of experiments on dogs which Dr. A. M. Ziegler and I did a few years ago. After we had incised the gallbladder and drained its contents into the peritoneal cavity, several of our animals recovered without any noticeable clinical symptoms. Autopsy revealed that the gallbladder fundus had healed without evidence of any general peritonitis and with only a few adhesions about the immediate vicinity of the gallbladder. This is undoubtedly what happens in patients. During and following operation on the gall tract, especially the common duct, there is frequently soiling of the regional peritoneum without any serious clinical results. On the other hand, in traumatic rupture of the gallbladder or ducts a general bile ascites may be caused which will result in death if not relieved by operation. In such cases the peritoneum shows an inflammatory reaction but no suppuration. Spontaneous rupture of the gallbladder is usually associated with infection and has a very high mortality rate. The experiments reported here today prove conclusively that uninfected bile in the peritoneal cavity of the dog in sufficient quantity will produce death in a very few hours. The rapid lowering of blood pressure, the blood concentration and the marked effusion of fluid into the peritoneal cavity with a high protein content indicate that secondary shock may be a lethal factor. Since human bile is apparently less toxic than dog bile, I am very doubtful whether the shock syndrome plays a very important rôle as a mortality factor in patients.

DR. EDWARD C. MASON, Oklahoma City: In working on this problem my associates and I have considered it from three different angles. Our first impression was that a toxic substance was liberated from the sectioned liver and we still believe that such is the case. More recently we have published observations which demonstrate that the peripheral portion of the rabbit's liver would remain sterile within the abdominal cavity and undergo aseptic autolysis. Such autolysis was accomplished by pathologic changes especially in the liver and kidneys. The second possible cause of death was introduced by Drs. Ellis and Dragstedt, who called attention to the presence of a Welch-like organism. This organism has been found at autopsy in all our animals dying following section of liver tissue. At present we feel that the function of the organism is only that of intensifying the liberation of toxic substances from the sectioned liver tissue. The organism may be injected intraperitoneally without producing harmful effects; also it may be placed in the abdomen infiltrated in fetal liver without causing death. Recently we have injected the organism intravenously, together with its substrate, without causing harmful effects. The last factor, that of dehydration, was considered in our first paper on autolysis and again recently we have tried to keep the animals alive, crowding fluids by mouth, stomach tube, intravenous salt solution, dextrose solution and gum in salt solution. We found that such crowding of fluids caused an

increase in the amount of fluid in the peritoneal cavity following death but failed to prolong the life of the animals. Our results were therefore similar to those subsequently repeated by Blalock, who observed that intravenous administration of fluids in clinical peritonitis was also accomplished by a marked increase in intraperitoneal fluid. We concluded in 1935 that three factors were active in causing the death of our animals and that the chain of events included (*a*) the toxic material liberated from the sectioned liver, (*b*) the bacterial action which intensifies the liberation of this toxin, and (*c*) increased permeability resulting from chemical irritation by the material.

DR. M. PINSON NEAL, Columbia, Mo.: The authors did not mention observations on the pancreas. I should like to ask whether interpretations were made on lesions demonstrable grossly or microscopically in that organ. Rewbridge in 1931 recorded an experimental study of bile peritonitis produced by the artificial escape of bile from the pancreatic ducts. In cultures from the peritoneal exudates he found gas-producing organisms. To get away from the bacterial agents, he used sterile bile salt injections and produced the same type of so-called bile peritonitis. Rewbridge in this work found a rather high percentage of his animals showing fat necrosis and concluded that the fat necrosis found in the pancreas, omentum and mesentery was due to some change in the pancreas or pancreatic ducts that permitted the escape of pancreatic juice into the peritoneal cavity. With a co-worker, I have been particularly interested in fat necrosis for a number of years. We have produced experimental fat necrosis by pure lipase obtained from fresh hog's pancreas, liver, and commercial pancreatins. We have also produced it by lipase extracts from vegetable sources, which eliminated trypsin. It would be very valuable if Dr. Harkins and his co-workers have some observation on pancreatic lesions or of fat necrosis to add to their recorded observations.

DR. H. M. TRUSLER, Indianapolis: I have been interested in the subject for several years and have recognized the fact that these animals die from shock. The results of unpublished blood chemical studies agree with those of the authors and are somewhat more elaborate. There are some interesting things about fresh liver that have not been mentioned. If an adult dog liver is ground in a food chopper with equal parts of physiologic solution of sodium chloride and the gross connective tissues are removed, the emulsion of liver cells that remains may then be injected through an 18 or 20 gage needle. Large amounts of this preparation may be injected into a dog and it will not kill him, even though a rich bacterial flora is present. In other words, the fresh liver cell suspension, even in 100 Gm. quantities, may be injected intraperitoneally into a normal dog without causing death. The connective tissue from the same liver when injected in a similar fashion is rapidly fatal to the dog. The animal dies in a state of shock and the peritoneal fluid shows a rich growth of the liver organisms. If, however, this fresh liver is autoclaved and finely ground, it can then be introduced into the peritoneal cavity, even after deliberate inoculation with the liver organism, and most of the animals will survive. Those which do die may live for a period of ten days. The picture is entirely different from the shock syndrome that has been described by the authors. Certainly autoclaving the liver does something to it so that it is no longer very toxic. The change does not seem to be merely a matter of sterilization. If this liver tissue is incubated for twenty-four hours or more and is then autoclaved, it is extremely toxic and kills the animal in a state of shock even though the peritoneum in this case remains sterile. There are some interesting things about this shock picture. It is more severe and differs considerably from traumatic shock or shock due to hemorrhage. For one thing, there is a tremendous initial rise in blood sugar after this injection, and then the blood sugar falls sharply to a very low level, so that the animal at death may have a blood sugar of 50 mg.

DR. ANTON J. CARLSON, Chicago: I am sorry Dr. Horrall is not here to discuss this paper. He did his work in my laboratory a number of years ago. I wish to congratulate Dr. Harkins and his co-authors on well conceived experiments. So far as I know, the emphasis on the loss of fluid from the blood vessels in bile shock is new. But there are other factors. We know that the bile does not need to be put in the peritoneum to kill; intravenous injection of bile kills. I am ready to accept the conclusion that where this large amount of fluid is lost it is a contributory factor in death. It is astonishing how much blood a normal dog can lose without dying, without going into shock. Of course, if there are poisons in the system such as anesthetics, bile or other irritants over the whole peritoneum, smaller quantities of blood loss will probably cause death by shock.

DR. NORMAN E. FREEMAN, Boston: Much has been said concerning the loss of plasma into traumatized regions as the mechanism for the reduction of blood volume in surgical shock. The amount of fluid in the peritoneal cavity in certain of the authors' experiments furnishes an example of such a mechanism. I fully believe that this loss of plasma is of real significance. In addition, the possibility of absorption of toxic substances has been discussed. Ether has also been mentioned as one of the factors that may produce shock. There is an additional factor which I believe may be of some importance in the production of shock in these experiments which has not been brought up. That factor is the afferent stimulation from the chemical trauma to the peritoneal cavity. It is recognized that vasoconstriction is produced by afferent stimulation. Vasoconstriction, if prolonged, may lead to blood concentration and a reduction of blood volume. Possibly the traumatic action of the substances introduced into the peritoneal cavity might have produced sufficient reflex vasoconstriction to be in part responsible for some of the interesting results which the authors have reported.

DR. HENRY N. HARKINS, Chicago: I mentioned the difference between human and experimental bile peritonitis, the reason for which is partly the marked difference in concentration between gallbladder bile and duct bile. If the bile acts as an irritant, the more concentrated bile undoubtedly is much more irritant. We did all our experiments on bile peritonitis with gallbladder bile taken from a number of other dogs and inserted into one dog, using more than we could get from one single dog. In human beings, even if a fairly large gallbladder ruptures, 50 or 60 cc., very little bladder bile is lost. If after operation there is a leakage from the common duct, such leakage is of the less irritating bile. In our experiments we required at least 2 cc. of gallbladder bile per kilogram to produce death. In an ordinary sized man this corresponds to about 150 cc. Very seldom does that much concentrated bile result from rupture of a gallbladder. Referring to Dr. Mason's statement concerning posture, we noticed no special position assumed by the animals at death. Our work differed from that of some previous workers in that instead of leaving the animals alone after injection of bile and finding them dead the next morning, we sat up and watched them as they died. We did not notice any peculiar position at the time of death. Of all the series of dogs, only one dog died in convulsions. Concerning the anaerobic organisms present in these conditions, it is of interest that, while they were found by us at death in every case in which liver was implanted intraperitoneally, they were not found regularly in bile peritonitis. These cultures were taken immediately at death rather than at some indeterminate time later. I wish to point out that both Dr. Trusler and Dr. Mason mentioned some time ago that these conditions may be associated with shock and that this idea is not original with us. The bacteria that Dr. Trusler and his associates isolated from the peritoneal cavity were said by them not to produce exotoxins. In certain animals in which there was not sufficient peritoneal fluid to account for death, very extensive edema of the dependent portions of the body was present and it is possible that the fluid might have gone to these other regions. Dr. Carlson has mentioned that large amounts of blood can be lost from the dog without production of death. In animal experiments, Blalock and others have shown that blood plasma can be lost in much smaller amounts than whole blood, the ratio of the two being about one of plasma to two of whole blood. We have noticed that as the time of death approached even in animals in which the blood pressure had not yet fallen markedly, there was a vasoconstriction of the peripheral vessels as denoted by the fact that, when the ears were cut for blood counts, blood was very difficult to obtain. In several instances we had to cut even the femoral artery to obtain sufficient blood for blood counts.

THE CORBUS-FERRY GONOCOCCUS BOUILLON FILTRATE

A CLINICAL STUDY

ROGERS DEAKIN, M.D.
Chief of the Genito-Urinary Clinic, Washington University Outpatient Department
ST. LOUIS

The Genito-Urinary Section of the Washington University Outpatient Department has for some time been engaged in a study of the various medicaments and procedures proposed for the most intelligent treatment of gonorrhea and its complications. We have felt that carefully controlled and conscientiously studied clinical research in these cases was quite compatible with and could be carried out without sacrificing unduly the primary function of the clinic, namely, to cure the disease in the simplest, speediest and most economical way possible, as well as to carry out as much of an educational program as we could under the circumstances.

Like most such clinics connected with a teaching institution, we have had to depend on physicians who volunteered their services and time, we have had to combat poverty, ignorance, indifference and general viciousness on the part of the patient, and the attempt to get a sufficient number of carefully observed controlled cases is, and I suppose always will be, the occasion for much discouragement. The tremendous amount of work that must be discarded because of the failure of the patients to return until their case is closed to the complete satisfaction of the investigator has caused many a doctor to give up the problem, which he started in earnest good faith and allowed to drop in disgust because of the apparent complete indifference of the average clinic patient.

TABLE 1.—*Acute Gonorrhea*

	Filtrate	No Filtrate
Negative complement fixation	8 cases O. K. 4 recurrences 1 epididymitis 1 arthritis 1 prostatitis	5 cases O. K. 2 recurrences 1 epididymitis 1 acute posterior urethritis 1 persistent infection
Positive complement fixation	6 cases O. K. 8 recurrences 2 epididymitis 2 prostatitis	3 cases O. K.

We do believe, however, that such a clinic is the place to test out every claim, be it for a vaccine, a new chemical or what not, which has any semblance of decency in either its origin or its rationale, and because of this we have consistently encouraged at least a preliminary trial of various substances advocated in the therapeusis of gonorrhea.

We have been studying the Corbus-Ferry gonococcus bouillon filtrate for a year. That we have kept it up that long is in itself an indication that we felt it had clinical merit. As a matter of fact, we were furnished a considerable amount of the original experimental product four or five years ago, and while no report was made, since we saw no startling benefit from its use at that time, even then there were indications that it or a similar product might eventually lead to something. Accordingly, when the opportunity was again offered to use the newer filtrate we were happy to undertake a series of cases such as is reviewed here.

Dr. Ralph Muckenfuss of the laboratory encouraged us to begin the routine use of the complement fixation test for gonorrhea at the start for two reasons: first, that we might determine, at least for our own information, its general value in gonorrheal work, and, second, since we were using an immunologic or antigenic agent as a therapeutic measure, it would not be inappropriate to correlate a study of the antigenic response of the blood in both filtrate and nonfiltrate cases.[1] To date we have almost a thousand blood reports on gonorrheal and nongonorrheal cases, which I intend at some later date to summarize.

During the past year we have started 112 men with acute or chronic gonorrhea[2] on the filtrate. Fifty-two of them may properly be included in the statistics presented together with thirty control cases. The other sixty filtrate cases and a similar percentage of controls have had to be discarded for one reason or another, mainly because this type of person in a clinic usually has no interest in his troubles past the stage when it is no longer painful to urinate.

TABLE 2.—*Chronic Gonorrhea*

	Filtrate	No Filtrate
Negative complement fixation	9 cases O. K. 2 prostatitis	8 cases O. K. 2 recurrences
Positive complement fixation	1 case O. K. 5 recurrences 2 epididymitis	6 cases O. K. 1 epididymitis

The local treatment in both groups consisted of urethral injections of 0.5 per cent solution of strong protein silver twice daily and 10 minims (0.65 cc.) of oil of santal by mouth three times a day. The filtrate group received in addition weekly intradermal injections of the filtrate starting with 0.5 or 0.1 cc. and increasing 0.1 cc. each time until 0.7 cc. was reached. Variations of this program were made when indicated according to the manufacturer's directions. Even though I did not give each treatment personally, I assumed complete responsibility for the therapy instituted, so that the two seniors who were doing most of the actual work would be carrying out in the main a routine type of local treatment in both the filtrate and control groups. The personal equation would therefore be that much more limited and certainly subject to the same errors and limitations in each group.

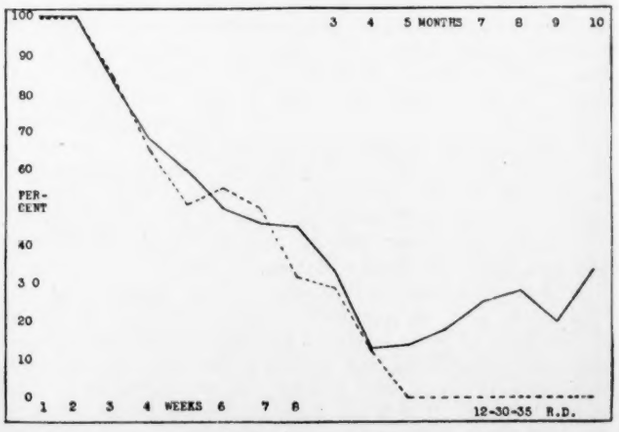


Chart 1.—Percentage of positive smears in acute and chronic gonorrhea. Solid line, Corbus-Ferry filtrate; broken line, no Corbus-Ferry filtrate.

Messrs. Standard and Mueller worked with the author in this study, and Dr. J. D. Ralston of Parke, Davis & Co. provided the material used.

1. The technic for the complement fixation test follows that described by R. F. Parker (J. Infect. Dis. **55**: 88 [July-Aug.] 1934), except for fixation at 37 C. for one hour instead of five hours at 5 C.

2. Men with no history of a previous gonorrhea who presented themselves for treatment within six weeks from the onset of their discharge were considered to have acute gonorrhea. Those who had had their disease longer or who gave a history of repeated infections were considered to have chronic gonorrhea.

In the first curve (chart 1), designed to show the behavior of the acute and chronic cases together, with and without the filtrate, the percentage of positive smears obtained on successive weeks and months from each group has been charted. I do not wish to leave the impression that we were able to obtain such smears on every successive week or month in every patient. On the contrary, there are fairly numerous breaks. We have repeatedly recorded positives, for instance, in weeks following a definite positive finding until a definite negative or positive was obtained. In the same manner, negatives have been inserted in blank weeks where negatives preceded and succeeded the interpolated record. I do wish it to be plain, however, that we tried hard to make weekly or monthly smears in each case, so that the interpolations have been relatively few.

I fully appreciate that this type of curve represents but one phase of the case progress, but it is adaptable to representation in chart form and indicative of the course of the disease. A comparison of these curves with clinical progress can be made by referring to the initial differentiation between filtrate and nonfiltrate case in table 3.

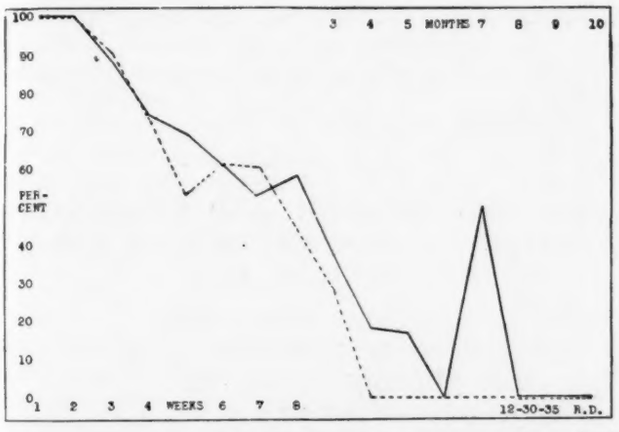


Chart 2.—Percentage of positive smears in acute gonorrhea. Solid line, Corbus-Ferry filtrate; broken line, no Corbus-Ferry filtrate.

The second curve (chart 2) contrasts the behavior of the acute gonorrheas only with and without the filtrate in the same manner.

The third curve (chart 3) is a similar comparison of the chronic gonorrheas.

The late rise in both charts 2 and 3 may be explained by an occasional positive smear from recurrence, or possible reinfection, at a time when most of the patients had been dismissed. One or two such positives in a relatively small group of smears creates a relative disproportion in the curve. For instance, in chart 3, six out of eighteen men given the filtrate were still under observation in the eighth month. Of these, two had positive smears and four were negative.

At the same time, if one again refers to table 3, in which a percentage result according to clinical progress is recorded, it will be seen that the somewhat poorer behavior of the filtrate cases in both the acute and chronic gonorrheas is definitely reflected in these curves made from the tabulation of smears.

Tables 1 and 2 show in brief the clinical results obtained in the acute and chronic groups with and without the filtrate, further subdivided according to the behavior of the complement fixation test. An uneventful course from onset to cure is considered "O. K." A complication of any sort made the case "unsatisfactory," even though the clinical course, so far as time element or end results were concerned, proved satisfactory eventually.

The degree of reaction of the complement fixation test is not differentiated in tables 1 and 2. If the individual at no time while he was under observation showed any degree of fixation, he was placed in the

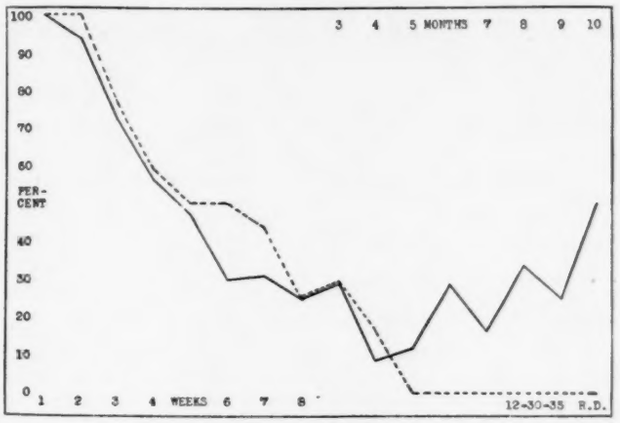


Chart 3.—Percentage of positive smears in chronic gonorrhea. Solid line, Corbus-Ferry filtrate; broken line, no Corbus-Ferry filtrate.

negative blood group. On the other hand, any report of from one plus to four plus from the laboratory at any time during his disease caused us to include him in the positive blood group. Needless to say, many individuals never showed anything more than a weak reaction, some stayed strongly positive during their entire observation, and most of those who developed a four plus reaction showed a definite improvement or complete change to negative as treatment and observation continued.

The analysis of the cases (table 3) proved most interesting. If the cases (eighty-two in all) were divided simply into two groups, filtrate or no filtrate, there is an appreciable difference in their clinical performance as evidenced by the percentage figures 46 and 73. Continue this analysis, but separate the acute from the chronic cases, again with and without the filtrate, and the percentage figures obtained give the

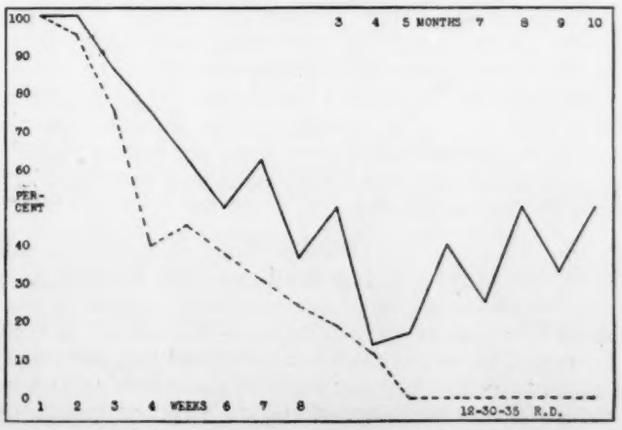


Chart 4.—Percentage of positive smears in chronic gonorrhea. Solid line, positive blood group with filtrate; broken line, positive blood group with no filtrate, negative blood group with filtrate, and negative blood group with no filtrate.

impression that it is the acute gonorrheal group placed on the filtrate at the onset of their disease which suffers by comparison with those acute cases in which the filtrate was not administered and the filtrate and nonfiltrate chronic gonorrheas. Even here in the chronic gonorrheas with filtrate the percentage of satisfactory

clinical results (52 per cent) is lower than the general average (nonfiltrate, 73 per cent) or the 82 per cent in the chronic group without filtrate.

However, if the group is still further subdivided, so that the acute and chronic groups are considered according to whether or not their bloods were positive or remained consistently negative, again with or without the filtrate, it will be noted that in the acute group the results generally were rather unsatisfactory except for the nonfiltrate group with positive blood. The number of individuals that could be included here, however, is too small to justify much consideration.

TABLE 3.—*Percentages of Satisfactory Clinical Results*

Type of Case	Complement Fixation	No. of Cases	Therapy	No. of Cases	Percentage O. K.
Acute and chronic	.....	82	Filtrate	52	46
			No filtrate	30	73
Acute	.....	46	Filtrate	33	42
			No filtrate	13	61
Chronic	.....	36	Filtrate	19	52
			No filtrate	17	82
Acute	Positive	21	Filtrate	18	33
			No filtrate	3	100
	Negative	25	Filtrate	15	53
			No filtrate	10	50
Chronic	Positive	15	Filtrate	8	13
			No filtrate	7	86
	Negative	21	Filtrate	11	82
			No filtrate	10	80

The most startling discrepancies appear in the chronic group, in which a combination of positive blood and the filtrate therapy gave a very low percentage of good results (13) and in the remaining three groups, one with positive blood and no filtrate, a second with negative blood and filtrate, and the third with negative blood and no filtrate gave us a very high percentage (86, 82 and 80) of clinically satisfactory results.

To see whether this interesting fact with regard to the chronic gonorrheas was substantiated in any other way, I again resorted to a plotted curve in which the cases included in the positive blood filtrate group (13 per cent clinically satisfactory) are plotted against the other three chronic groups, and chart 4 presents what I consider irrefutable evidence of the accuracy of our observations. In this chart the tendency of the patients to retain their positive smears and the erratic nature of the curve due to relapses and complications in the chronic group in which positive bloods had developed and the filtrate had been given is so definite as compared with the smooth course indicated in the remaining chronic cases as to make me believe that the use of the filtrate in a chronic case with positive blood is quite contraindicated.

COMMENT

In the beginning I pointed out that we had as a routine procedure and almost without exception continued the use of the filtrate up to 0.7 cc. It is quite possible that, as Dr. Corbus has pointed out, this represented an overdosage for some of the individuals under study. We were, however, on the look out constantly for skin reactions which would indicate that we were approaching or had reached the limit of injection and did not knowingly exceed this amount at any time. Moreover, I am quite sure that we did not in any case see the acute local exacerbation that has been described by Dr. Corbus and others.

It is not within the province of this paper to undertake a discussion of the immunologic or serologic properties of the Corbus-Ferry gonococcus bouillon filtrate. To me, clinically, it has specific properties that may produce a good or bad result, depending on the type of case or perhaps the manner in which it is used therapeutically. Furthermore, I am unable to correlate our results with the reported good results obtained in gonorrheal arthritis, in which the complement fixation is nearly always positive. We have not seen enough arthritis of this sort to be able to report any results. It seems to me, however, that a possible explanation for some of our results may lie in this possibility; i. e., that the filtrate serves to break down the natural walling off and sterilizing process which the body contrives against further invasion by the gonococcus much as tuberculin does in certain types of tuberculosis.

SUMMARY

A series of both acute and chronic cases of gonorrhea from an outpatient clinic, in which the Corbus-Ferry gonococcus bouillon filtrate was used in a routine manner were compared with a control group. In both instances the same local treatment and general hygienic measures were instituted. Complement fixation tests were made repeatedly in all cases.

The results would indicate that acute gonorrheas do not do as well with the filtrate as without, that the poorest results with the filtrate are obtained in chronic gonorrhea with a positive gonococcus complement fixation, and that the best results are obtained in chronic gonorrhea with a consistently negative complement fixation test.

3701 Westminster Place.

THE PRESERVATION AND CONCENTRATION OF HUMAN SERUMS FOR CLINICAL USE

STUART MUDD, M.D.
EARL W. FLOSDORF, PH.D.
HARRY EAGLE, M.D.
JOSEPH STOKES JR., M.D.
AND
AIMS C. McGUINNESS, M.D.
PHILADELPHIA

During convalescence from many infectious diseases the blood contains antibodies that are capable of conferring passive immunity. Transfer of convalescent human blood, plasma or serum to a susceptible recipient before or during exposure or in the incubation period of a number of diseases may give either complete protection or attenuation. In a smaller number of infections, therapeutic benefit may also be anticipated from convalescent human serum. The difficulty of obtaining such serum in sufficient amounts, however, and its cost must necessarily impose limitations on its use.

Healthy adults afford a second and less limited source of human serum the value of which lies chiefly in the prevention and less frequently the treatment of the infectious diseases of childhood. The passive immunity that is transmitted transplacentally from the mother to the new-born infant is lost during the first year of life. Acquisition of active immunity occurs slowly and reaches its maximum only in early adult life.[1] During the years of childhood humoral immunity

From the Departments of Bacteriology and Pediatrics, University of Pennsylvania School of Medicine, and the Children's Hospital of Philadelphia.

1. For detailed discussion of this process and of the relative rôles in it of infection and of physiologic maturation, reference may be made to Topley, W. W. C.: An Outline of Immunity, Baltimore, William Wood & Co., 1933, or Baumgartner, Leona: The Relationship of Age to Immunological Reactions, Yale J. Biol. & Med. **6**: 403 (March) 1934.

is in general low and may be augmented at critical times of exposure or definite infection by the serum of properly chosen healthy adults.

Donors artificially immunized against a given infectious agent are a third possible source of human serum. Thus far utilization of this source has been chiefly in the relatively small number of cases treated by specific immunotransfusion. A number of experiments with specifically immunized donors are in progress now, however, and this method may well find much wider application in the future.

Human serums afford a means of prophylaxis against certain diseases for which animal serums are not obtainable; for instance, measles, chickenpox and mumps. With reference to other diseases the choice of human versus animal serum is determined largely by practical considerations of availability and potency. In the treatment of such severe and acute diseases as diphtheria, meningococcic meningitis and type I lobar pneumonia or in the prophylaxis of tetanus, horse antiserums of high potency are clearly the agents of choice.

In the management of streptococcic infections, on the other hand, there is definite competition between human and horse serums, and the present trend is toward the use of human serum. The considerations involved are complex. Hemolytic streptococci are both toxigenic and invasive, and the ideal therapeutic agent should contain both antitoxic and antibacterial antibodies. The problem of obtaining the required antibacterial properties is rendered exceedingly difficult by the fact that there are at least twenty-seven known serologic types of streptococci among the human pathogens [2] and that a given disease such as scarlet fever may be caused by any one of a considerable number of these types. Streptococcus horse serums of adequate polyvalence in antibacterial properties have yet to be prepared. On the other hand, there is much evidence of the presence of specific antistreptococcus antibodies in the serums of human beings convalescent from streptococcic disease.[3] In our judgment, therefore, the best expedient at the moment available for obtaining antibacterial serums of adequate polyvalence against hemolytic streptococci is the use of large pools of serum from scarlet fever convalescents or from healthy Dick-negative normal adult donors. Such theoretical considerations find some practical substantiation from the favorable results with pooled human serums reported by Weaver,[4] Meader,[5] Hoyne, Levinson and Thalhimer,[6] McGuinness, Stokes and Mudd,[7] and others in the prevention and treatment of scarlet fever and its complications, and in the treatment of other hemolytic streptococcus infections.[8] With regard to antitoxic properties, properly prepared horse serums are undoubtedly of far higher potency.[9] Yet this advantage is outweighed in the minds of many clinicians by the disadvantages of serum sickness and the possibility of anaphylactic accidents with the use of horse serum.

Methods for the preservation of serum with a minimum of deterioration have been evolving for nearly half a century. Desiccation [10] was an early method of definite value. More recently work [11] has indicated desiccation in vacuo from the frozen state to be the best method at present known. Procedure and apparatus for desiccation in vacuo from the frozen state have been fully described in a recent publication.[11e] Briefly, the serum or other biologic material to be preserved is distributed with sterile precautions into glass containers. These are immersed in a bath of Dry-Ice in a commercial solvent (Methyl Cellosolve) at a temperature of approximately —75 C. The containers of the frozen serum are attached to a manifold which leads through a condenser to a vacuum pump. The condenser is kept at —75 C. with a bath of Dry-Ice in the same solvent. The whole system is rapidly evacuated and held at a pressure below 0.05 mm. of mercury by the vacuum pump. Water vapor evaporates from the frozen serum to be trapped as ice in the condenser; the rate of evaporation is sufficient to keep the serum frozen throughout the process of desiccation. The containers are sealed without breaking the original vacuum. Storage for prolonged periods should be at refrigerator temperature. The light porous residue of serum solids quickly and completely dissolves in distilled water to regenerate a serum the potency of which is not detectably different from the original serum. This procedure has been termed the "lyophile" process.[12]

The rates of deterioration of lyophile serums under various conditions are at present under investigation. Sufficient data are available, however, to show conclusively that potency is much better preserved in this than in liquid form. Striking examples have been published by Eagle, Strauss and Steiner [13] and by Boerner and Lukens,[14] who have shown that lyophile guinea-pig complement at refrigerator temperatures undergoes no detectable deterioration for ten months and has definite advantages over liquid complement for the Wassermann laboratory. Pooled human adult serum, lyophile

2. Griffith, F.: The Serological Classification of Streptococcus Pyogenes, J. Hyg. **34**: 542 (Jan.) 1935.

3. Lyons, Champ, and Ward, H. K.: Studies on the Hemolytic Streptococcus of Human Origin: II. Observations on the Protective Mechanism Against the Virulent Variants, J. Exper. Med. **61**: 531 (April) 1935. Hare, R.: The Production of Bacteriotropins for Haemolytic Streptococci by Patients Infected with That Organism, J. Path. & Bact. **35**: 701 (Sept.) 1932; Alterations in the Bactericidal Power of the Blood Which Occur During Haemolytic Streptococcal Infections in the Puerperium, ibid. **41**: 61 (July) 1935. Tunnicliff, Ruth: Opsonins for Diplococcus Morbillorum and for Streptococcus Scarlatinae in Convalescent Measles Serum, Convalescent Scarlet Fever Serum and Placental Extract, J. Infect. Dis. **58**: 1 (Jan.-Feb.) 1936. Lyons, Champ: Immunotransfusion and Antitoxin Therapy in Hemolytic Streptococcus Infections, J. A. M. A. **105**: 1972 (Dec. 14) 1935.

4. Weaver, G. H.: The Treatment of Scarlet Fever with Immune Human Serum, J. Infect. Dis. **22**: 210 (March) 1918.

5. Meader, F. M.: Scarlet Fever Prophylaxis: Use of Blood Serum from Persons Who Have Recovered from Scarlet Fever, J. A. M. A. **94**: 622 (March 1) 1930.

6. Hoyne, A. L.; Levinson, S. O., and Thalhimer, William: Convalescent Scarlet Fever Serum: Its Prophylactic and Therapeutic Value: A Review of 2,875 Cases, J. A. M. A. **105**: 783 (Sept. 7) 1935.

7. McGuinness, A. C.; Stokes, J., Jr., and Mudd, Stuart: The Clinical Uses of Human Serums Preserved by the Lyophile Process, to be published.

8. Thalhimer, William, and Levinson, S. O.: Pooled Convalescent Scarlet Fever Serum Treatment of Diverse Streptococcic Infections, J. A. M. A. **105**: 864 (Sept. 14) 1935.

9. Rhoads, P. S., and Gasul, B. M.: Convalescent Scarlet Fever Serum and Commercial Antitoxin, J. A. M. A. **102**: 2005 (June 16) 1934.

10. Martin, C.: A Simple and Rapid Method of Desiccation and Keeping Substances Sterile During the Process, J. Path. & Bact. **3**: 507, 1895-1896. Rosenau, M. J.: The Immunity Unit for Standardizing Diphtheria Antitoxin, Bull. 21, Hyg. Lab., Washington, D. C., 1905.

11. (*a*) Shackell, L. F.: An Improved Method of Desiccation with Some Applications to Biological Problems, Am. J. Physiol. **24**: 325 (June) 1909. (*b*) Sawyer, W. A.; Lloyd, W. D. M., and Kitchen, S. F.: The Preservation of Yellow Fever Virus, J. Exper. Med. **50**: 1 (July) 1929. (*c*) Elser, W. J.; Thomas, R. A., and Steffen, G. I.: The Desiccation of Sera and Other Biological Products (Including Micro-Organisms) in the Frozen State with the Preservation of the Original Qualities of Products so Treated, J. Immunol. **28**: 433 (June) 1935. (*d*) Reichel, J.: Masucci, P., and Boyer, J.: Personal communication to the authors. (*e*) Flosdorf, E. W., and Mudd, Stuart: Procedure and Apparatus for Preservation in "Lyophile" Form of Serum and Other Biological Substances, J. Immunol. **29**: 389 (Nov.) 1935.

12. Although here used in a somewhat special sense, the term "lyophile" is not new but is widely used in colloid chemistry to denote the affinity of a colloid for the liquid in which it is dispersed. The serum proteins preserved by this method maintain their original affinity in this respect, and in consequence they exhibit a remarkably rapid rate of dissolution.

13. Eagle, Harry; Strauss, Henry, and Steiner, Rudolf: Use in Wassermann Reaction of Uniform and Stable Dehydrated Complement, Am. J. Clin. Path. **5**: 173 (May) 1935.

14. Boerner, F., and Lukens, M.: The Advantages of Vacuum Dried Complement for Use in the Routine Wassermann Reaction, Am. J. M. Sc. **192**: 272 (Aug.) 1936.

processed and kept at icebox temperature for seventeen months, has been effectual in prophylaxis against measles and in the reversal of positive Dick tests. Lyophile convalescent measles and mumps serums after one year of storage at icebox temperatures have also been effectual in prophylaxis against these diseases.

Lyophile serum may be restored to liquid form by the addition of distilled water to one-half or even to one-fourth the original volume. This concentration is of considerable practical advantage, particularly in the routine intramuscular administration of the serum to children, since less painful injections of smaller volumes of liquid are thus made possible.

The Philadelphia Serum Exchange was established at the Children's Hospital of Philadelphia in the spring of 1934. Its purposes were to make available in and about Philadelphia human serums of known value, to investigate the usefulness of such serums in lyophile form, and to explore the possibilities of new or unrecognized values of human serums made possible by current advances in immunology and explicitly by the lyophile process. Because of our preoccupation with the application of the lyophile process, practically all serums distributed from the exchange have been in this form.[15]

The methods used for the collection of serums have been somewhat similar to those employed by other large serum centers such as have existed for some time in Detroit and Chicago. The cooperation of the Department of Public Health of Philadelphia has made it possible to approach through their own physicians patients discharged from the Municipal Hospital for Contagious Diseases and from the Philadelphia General Hospital. After permission of the family physician has been secured, these individuals are invited in person or by mail to act as donors and are offered a small fee for their blood. Healthy adults for pooled adult serum are secured through the social service department of the Children's Hospital. It has been practicable to bleed a healthy adult to the extent of 200 cc. about once a month. A careful history is taken of all donors, especially with reference to previous infectious disease. The donors are bled at the Children's Hospital or, when this is impracticable, in their homes.

The blood is collected in 400 cc. pyrex centrifuge bottles. Fitted on these bottles is a two-holed rubber stopper through which pass two glass tubes, one 2 inches and the other 3 inches long. To the 2-inch tube is attached a piece of rubber tubing 18 inches long; this tube contains a cotton plug and to its end is attached a hard rubber mouthpiece for suction. To the 3 inch glass tube is attached an 18 inch rubber tube, to the other end of which is fitted a "Luer-lock" adapter. A 2 inch No. 18 gage needle will give an adequate flow of blood when aided by the reduced pressure caused by the mouth suction and causes the donors little pain.

At the end of the bleeding the suction is stopped, the tourniquet is released about twenty seconds later and the needle is then withdrawn. Enough blood may then be milked from the tube to which the needle is attached for the performance of the Wassermann or Kahn test. After the bleeding, the rubber stopper with the bleeding and suction tubes attached is removed from the bottle. The neck of the bottle is flamed and then closed with a solid rubber stopper, which is sterile. In order to give added protection a piece of sterile lead foil is then placed over the solid stopper and pressed down close to the side of the bottle. A number of bleeding outfits, i. e., the perforated stopper with rubber tubing attached, and centrifuge bottles, are kept on hand and are put up and autoclaved in packets.

The blood after collection in centrifuge bottles is stored over night in the refrigerator. The clot is then "rimmed," the bottle centrifuged and the serum removed with sterile precautions. This is best done by aspiration with negative pressure in a dust-free room. The serum so obtained containing erythrocytes is recentrifugated, and aspiration is repeated without disturbing the red cell sediment. The serum is not mixed with serum from other donors for pooling until a negative Kahn report has been received and until a sterility test has shown the absence of gross contamination and of pathogenic bacteria.

The work of pooling and processing was done at the beginning in the department of bacteriology but for the past two years has been conducted at the Mulford Laboratories of Sharp & Dohme through the courtesy of the director, Dr. John Reichel, and Mr. John S. Zinsser, president of Sharp & Dohme. The serum obtained on any given day is transferred to pyrex bottles and rapidly frozen in a bath of Dry-Ice in Methyl Cellosolve. The frozen serum is stored in a refrigerating vault at from —12 to —15 C. until serum from thirty to ninety donors has accumulated. All is then thawed, mixed and filtered through a Berkefeld W filter.[16] The filtered serum is distributed sterilly into the final containers and there frozen and lyophile processed. Sterility tests are conducted on the filtered serum in accordance with the requirements of the National Institute of Health, and the serum is not released until sterility has been demonstrated.

The lyophile containers are stored in an icebox at the Children's Hospital until required by physicians. A second distribution center has been maintained at the Abington Memorial Hospital by Dr. John Eiman. The serum is regenerated for use by injection of sterile distilled water into the container. Since the serum contains no chemical bacteriostatic agent, the regenerated serum should not be allowed to stand for longer than an hour before administration. The redissolved serum is given by intramuscular injection.

The lyophile human serum prepared by this routine and regenerated appears turbid.[17] Examination under the darkfield microscope reveals that this turbidity is due to aggregated and coalesced lipid droplets.[18] To avoid any possible danger of capillary embolism due to these lipid aggregates, lyophile serum has not been administered intravenously in the work recorded in a paper to be published.

Lyophile human serum four times concentrated has, however, been used by Hughes, Mudd and Strecker[19]

15. A more economical practice in other human serum centers would doubtless be to use lyophile serum only for storage or shipping of serum in excess of current requirements or when concentration is important, thus saving the cost of lyophile processing.

16. The filters are tested by forcing air through the immersed and thoroughly wetted filter (Mudd, Stuart, in Rivers, T. M.: Filtrable Viruses, Baltimore, Williams & Wilkins, 1928). Those used allow air bubbles to pass when air pressure reaches 14 pounds per square inch.

17. In this respect human lyophile serum differs from lyophile horse serum, which regenerates to form a clear or only slightly opalescent solution. Other biochemical differences in the lipids of human and horse serum have been noted (Theorell, H.: Studien über die Plasmalipoide des Blutes, Biochem. Ztschr. **223**: 1, 1930).

18. The microscopic appearance resembles that of aggregated and coalesced chylomicrons as shown by Ludlum, Taft and Nugent: The Chylomicron Emulsion, J. Phys. Chem. **35**: 269 (Jan.) 1931.

19. Hughes, J.; Mudd, Stuart, and Strecker, E. A.: Reduction of Increased Intracranial Pressure by Concentrated Human Lyophile Serum, Tr. Am. Neurol. Soc., 62d meeting, June 1936, Arch. Neurol. & Psychiat., to be published.

and by McGuinness and Stokes [20] for the purpose of reducing cerebrospinal fluid pressure, and for this purpose the serum must be given intravenously. To prepare lyophile human serum for intravenous use the foregoing routine is modified. The pooled serum in large volumes is processed without filtration and is then regenerated. The turbid regenerated serum is clarified by passage under two atmospheres of air pressure through a Berkefeld V filter (such a filter testing at about 6 pounds). This clarified serum is then refiltered to ensure sterility through a Berkefeld W (14 pounds) candle and is distributed into final containers and again lyophile processed.[21] The volume of serum filtered should be as large as practicable in proportion to the size of the filters, in order to minimize losses by adsorption and occlusion in the filters. This doubly filtered, doubly processed serum redissolves to a clear or opalescent solution in as little as one-fourth its original volume of distilled water, and on intravenous administration has the desired clinical effect of reduction of cerebrospinal fluid pressure and increase of arterial blood pressure.[19]

Serum for therapy in scarlatina has been and could be prepared for intravenous administration should the advantage of the intravenous route justify the expense of processing and double filtering. It is perhaps worth pointing out that the procedure outlined for preparing lyophile serum for intravenous use does not require low temperature cold storage facilities. The serum is first processed in a container of the size required for the bleedings of that day. It may then be stored in an ordinary refrigerator until required or until sufficient for a large pool has accumulated. The serum is then regenerated, clarified and refiltered and may be used intravenously or intramuscularly in the liquid form or distributed into individual containers and lyophile processed for later use.

Mention may be made of the precautions against accidental transfer of syphilis in this use of human serum. Only serums from Kahn-negative donors are used. The serum is Berkefeld filtered. Finally one of us (H. E.) has shown that Spirochaeta pallida does not survive lyophile processing. Rabbit chancres were emulsified, shown to be infectious for rabbits, and lyophile processed; the residue was reemulsified and injected intratesticularly into six new rabbits. These rabbits showed no signs of syphilis, and after a year four survivors were found to be susceptible to the same strain of Spirochaeta pallida. There has therefore been a triple safeguard against accidental transmission of syphilis.

The extremely favorable clinical results in prophylaxis and therapy obtained with lyophile serums will be reported in a later paper.[7]

SUMMARY

The clinical usefulness of human serums has been considerably broadened by the development of methods for their preservation and concentration. Convalescent serum may be collected at times of epidemic prevalence and held until needed. Donors may be specifically immunized and their serum harvested for later use. Pooling on a large scale, for the purpose of augmenting polyvalence, is facilitated.

The most distinctive advantages of the procedures outlined possibly are in increasing the practicability of the use of serum of healthy adult donors. Such adult serum collected in large pools and properly preserved is proving extremely effective in the prophylaxis of infectious diseases of childhood.

Concentration has the general advantage of reducing the volume of serum to be injected. A special use of four times concentrated human serum in reducing cerebrospinal fluid pressure is set forth in another paper.[19]

20. In cases of hydrocephalus in babies, intravenous injections with refiltered lyophile serum, concentrated four times, have been made. The resulting reduction of intracranial pressure may be of value in certain cases of the communicating type of hydrocephalus.

21. The idea of clarifying the turbid serum and reprocessing was adopted from the procedure of Eiser, Thomas and Steffen.[11c]

THE CLINICAL INVESTIGATION OF AN IMPROVED CRYSTALLINE INSULIN

PRELIMINARY REPORT

M. PAUL MAINS, M.D.
AND
CLARENCE J. McMULLEN, M.D.
Resident in Medicine and Attending Physician, Respectively, Cook County Hospital
CHICAGO

Clinicians have long felt the need for a slower and more prolonged action of insulin in diabetic patients to simulate the normally functioning pancreas in maintaining a more constant level of blood sugar. The rapidity with which insulin is absorbed and the short duration of its action often produce marked fluctuations in the blood sugar during the twenty-four hour period. Various modes of insulin administration have been tried, as well as various insulin compounds.

This study deals with the observations in the clinical use of an improved crystalline insulin as to its rate of absorption and its duration of effect in diabetic patients.

The material used was a solution of improved crystalline insulin developed by Dr. Melville Sahyun of Detroit.[1] A solution of the improved crystalline insulin cannot be distinguished in appearance from that of regular insulin. Our supply of this preparation was kept at room temperature for four months, with no decrease in potency. In this we confirm Dr. Sahyun's observations. Over a period of four months no untoward reactions, either local or general, were noted following the injection of the product, nor did any patient note any increase of discomfort over regular insulin.

TYPE OF PATIENTS

This series consisted of twenty-two cases admitted to the surgical diabetic service in the Cook County Hospital and three admitted to the medical service for diabetic management. Of the patients in the surgical service, there were fifteen with complaints which did not complicate their diabetic management; namely, four had arteriosclerotic feet, three had practically healed ulcers on the legs or feet, three had simple fractures, three had cataracts, one slight inflammation of a toe, and one a surgical operation, a perineorrhaphy, two and a half weeks previous to our study of her case. The remaining seven surgical cases presented disorders complicating the diabetic management: three presented

From the Diabetic Service, Cook County Hospital.

1. From a personal communication received from Dr. Melville Sahyun, we have the following information: "The improved crystalline insulin is dissolved in dilute hydrochloric acid and made up to 40 units per 1 cc. in 0.1 per cent tricresol and 1.6 per cent glycerol and sterilized in the usual manner. Tricresol is added as a preservative and glycerol to render the solution isotonic. Such or similar substances are added to all preparations of crystalline insulin on the market. Dilutions of this improved crystalline insulin have been subjected to 40 C. for seven months. No loss in potency was observed at the end of that period."

gangrene of a foot, two an infection of the stump following amputation, one multiple furuncles, and one an occipital carbuncle.

Ages varied from 26 to 74; ten were males and fifteen were females.

PROCEDURES

Blood sugar tests were made by the micromethod of Folin, the samples being drawn at 7:30 and 11 a. m. and at 2, 5 and 10:30 p. m. Daily twenty-four hour urine specimens on each patient were tested qualitatively for sugar with Haines' solution, and, if positive, the percentage of sugar was determined by Benedict's method.

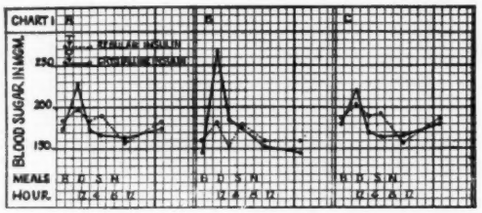


Chart 1.—*A*, an average of all the blood sugars in a group of eleven patients on each type of insulin. *B*, an average of all the blood sugars of two patients receiving one dose of insulin daily. *C*, an average of all the blood sugars of the remaining nine patients, those receiving two doses of insulin a day. Note the slower absorption of the improved crystalline insulin and its prolonged action resulting in lower fasting morning blood sugars.

The diet of each patient remained as nearly constant as possible throughout the course of blood sugar study on that patient. Diets were standardized as shown in table 1. Breakfast was served at 8 a. m., dinner at 11:30 a. m. and supper at 4:30 p. m. In addition, 100 Gm. of a 9 per cent fruit was left at the bedside to be eaten about 8 p. m. Thus there was a more stringent test on both types of insulin by having a liberal allotment of carbohydrate for the evening meal and further by giving the patient 9 Gm. of carbohydrate at bedtime, tending to raise the blood sugar level at 10:30 p. m. and the next morning. Insulin was administered from five to fifteen minutes before the meals.

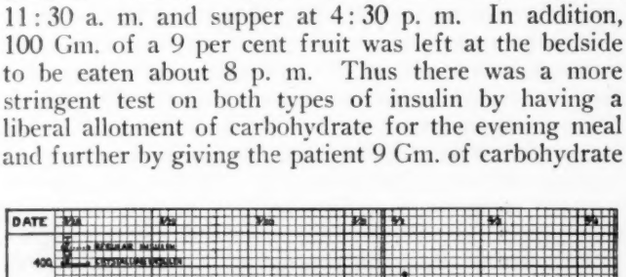


Chart 2.—One of the patients included in chart 1 *B*. She was 74 years of age and was known to have had diabetes for five years. She was admitted January 7 with a fractured femur. Recovery was uneventful. She was on diet 3. Her chart shows the slower absorption of the crystalline insulin.

Two experiments were made on two groups of patients. The first was to compare the relative efficacy of regular insulin and improved crystalline insulin. The second was to observe the effect of replacing multiple daily doses of regular insulin with a single large dose of crystalline insulin.

EXPERIMENT ONE

To compare the relative efficacy of the two types of insulin, curves were plotted for eleven patients already stabilized on regular insulin. These patients were subsequently stabilized on equal doses of crystalline insulin administered at the same hours, their diets remaining unchanged, and further determinations were made. The eleven patients were not selected but were taken in order of admission and included conditions complicating and not complicating their diabetic management; nine were on two doses of insulin a day and two were on one dose. They were on either diet 2 or diet 4, as explained in table 1.

The series included a total of 280 blood sugars, 164 with the patients on regular insulin of various pharmaceutical companies and 116 on improved crystalline insulin. There was, however, such variability of the daily blood sugar curve in so many cases even though uncomplicated and regardless of the type of insulin used, whether regular or crystalline, that comparisons of single days' curves, or even the curves of several days, on any one patient might not result in accurate conclusions. Apparently there are factors other than diet and insulin that vary the blood sugar, such as sympathetic nervous disturbances, the functions and dysfunctions of other endocrine glands, alimentary absorption, and infection. Thus the daily curve on any one patient might remain fairly constant for several days and be followed by a radically different curve, presumably owing to one or more of these intercurrent factors. For this reason it was assumed that an average of all the blood sugar levels at each of the five times during the day of all eleven patients while on each kind of insulin should show the activity of that preparation better than one or two individual curves.

TABLE 1.—*Standardized Diets*

Diet No.	Carbohydrate	Protein	Fat	Percentage of Carbohydrate Allotted to: Breakfast	Dinner	Supper	Nourishment	Calories
2	120	62	86	34	19	39	8	1,500
3	140	72	83	34.5	26	33	6.5	1,600
4	160	76	84	30	35	29	6	1,700
5	180	79	84	27	32	36	5	1,800
7	220	87	85	29	32	35	4	2,000

TABLE 2.—*Blood Sugar*

	Hours: 7:30 a.m.	11 a.m.	2 p.m.	5 p.m.	10:30 p.m.
Regular insulin:					
Number of determinations	42	31	31	31	29
Average blood sugar	182	199	183	190	159
Crystalline insulin:					
Number of determinations	33	20	21	21	21
Average blood sugar	175	229	173	168	164

Potency.—An average of all the blood sugars with patients on regular insulin was 182.6, on improved insulin 182.2. This fact, plus the ability to keep patients aglycosuric, proves the new insulin to be equally efficient. Since the two types of insulin are equally potent, any differences in their action can be attributed to differences in their rates of absorption.

Insulin Reactions.—During the entire course of this investigation only five instances of insulin reactions were noted, in none of which did the patient ever

become comatose. One patient was subject to very frequent reactions with regular insulin, coma striking him almost immediately and before he would have time to summon aid or take any carbohydrate; prodromal symptoms were entirely absent. On crystalline insulin this patient had two reactions, one following his omission of the evening nourishment. In neither case did he lose consciousness, but his tongue felt so thick that his speech was unintelligible, although he was able to summon nurses and ask for some sugar. This apparently slow onset of hypoglycemia with crystalline insulin allows the patient ample time to ingest carbohydrate to forestall further reduction in the blood sugar level and thus prevent coma. None of the patients, except the one just mentioned, required any treatment for the hypoglycemia, the reactions being so mild as to cause very little discomfort.

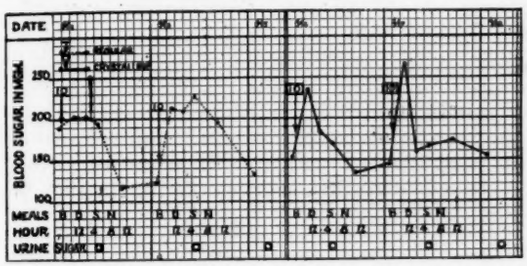


Chart 3.—One of the patients included in chart 1 *B*. Note the fairly level blood sugar maintained by the crystalline insulin after its period of delayed absorption. This patient was a Negress, aged 55, who was on diet 4. She was known to have had diabetes for several years and had been attending the diabetic clinic. She had arteriosclerosis of the legs and feet.

Delayed Absorption.—Chart 1 *A*, showing the blood sugar averages from table 2, clearly demonstrates the slower absorption of crystalline insulin; a dose given immediately before breakfast is not absorbed quickly enough to lower the blood sugar by 11 a. m. But after this sharp rise due to delayed absorption the blood sugar for the remainder of the day is maintained at a fairly constant level.

Chart 1 *B* is the average blood sugar curve in two uncomplicated cases on one dose of regular insulin for two or three days, then on the same dose of crystalline insulin for a like period. A much lower fasting, as well as a much higher 11 a. m. blood sugar while on crystalline insulin, is again apparent.

Chart 1 *C*, the average curve of the remaining nine cases, those receiving two doses of insulin a day, at breakfast and at supper, also showed the slower absorption of crystalline insulin by an increase of the blood sugar from 7: 30 to 11 a. m. and from 5 to 10: 30 p. m.

Delayed absorption is likewise shown in chart 2.

Duration of Effect.—Chart 1 shows that the effect of regular insulin is worn off by 2 p. m. and thereafter the blood sugar rises until 5 p. m. The new insulin is still active, as evidenced by a lowering of the blood sugar during this period. While with regular insulin (chart 1 *B*) the blood sugar dropped 20 mg. from 5 to 10: 30 p. m., it dropped 25 mg. with crystalline insulin; again, during the night, while the blood sugar remained level with regular insulin, there was a further drop of 5 mg. with crystalline insulin.

In chart 1 *C*, as pointed out in the section on delayed absorption, the 5 p. m. dose of regular insulin brought an immediate drop in blood sugar; the new insulin, because of its slow absorption, allowed a slight rise. Since the carbohydrate content of breakfast and supper are approximately equal, this rise undoubtedly would have been much higher, paralleling the 11 a. m. rise, had not the breakfast dose of crystalline insulin still been active. Despite the fact that the 10: 30 p. m. average was slightly higher with crystalline than with regular insulin, the prolonged action of the former caused a lower 7: 30 a. m. blood sugar.

Level Blood Sugar Curves.—The ability of improved crystalline insulin to maintain a more nearly constant blood sugar level after the period of initial delay in absorption was demonstrated in chart 1 *A*. It is also shown in chart 3 of a patient who was given only 10 units of insulin each morning, the amount necessary to prevent glycosuria. In accordance with hospital routine, this dose was given with the breakfast. Had it been given an hour earlier, the sharp rise at 11 a. m. would have been avoided and a more level blood sugar curve maintained throughout the day. But since we were using an entirely new type of insulin and had no previous clinical experience with it to guide us in its use, we confined our studies to its effect on the blood sugar under constant conditions and not to its possibilities in producing the ideal level blood sugar curve.

TABLE 3.—*Rate of Absorption*

Slow Absorption		Fast Absorption	
Number of Cases	Complication	Number of Cases	Complication
5	Arteriosclerotic feet	2	Gangrene of feet
2	Medical cases	2	Infected stumps
1	Postperineorrhaphy	2	Carbuncle
3	Simple fracture		
3	Cataracts		

Rate of Absorption.—The rate of absorption seems to be very dependent on some factor in the body, possibly the p_H. In this series of cases those who showed quick absorption of the morning dose of crystalline insulin as evidenced by a blood sugar lower at 11 a. m. than at 7: 30 a. m. were grouped together. Another group was made up of those whose blood sugar rose in spite of the dose of crystalline insulin at 8 a. m. The average daily dose and the average single dose of insulin in the two groups were the same. These two groups arranged as in table 3 clearly show that those whose response was rapid are the ones having an active and severe infection, while those showing slower absorption were the uncomplicated diabetic cases.

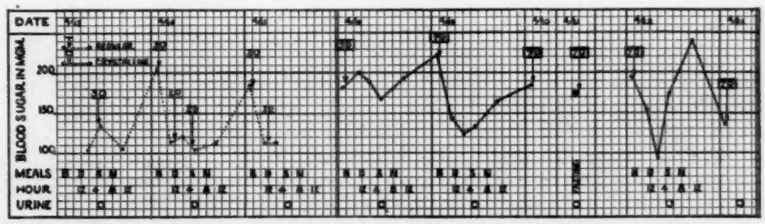


Chart 4.—A woman, aged 45, had had a painless ulcer on the right heel six months before admission. She was known to have had diabetes for eight years and was on diet 2. There was an immediate larger drop in blood sugar following 30 units of regular insulin than following 70 units of crystalline insulin.

This observation was made on patients receiving small or moderate doses of insulin, not over 40 units per dose. Even with much larger doses of the new insulin there was an 11 a. m. rise in 33 per cent of the determinations in uncomplicated cases. The immediate

drop in the remaining determinations probably was due to the prolonged action of the preceding large dose.

Further studies of the effect of complications on the rate of absorption, with frequent determinations of the carbon dioxide combining power of the blood as an index of acidosis and of the rate of sedimentation of erythrocytes as an index of the severity of infection, might prove illuminating.

EXPERIMENT TWO

Five patients receiving two or three doses a day of regular insulin, totaling from 30 to 80 units, were put on a single large dose of crystalline insulin. These patients had complaints not complicating their diabetic management. There was no dietary change during the experiment.

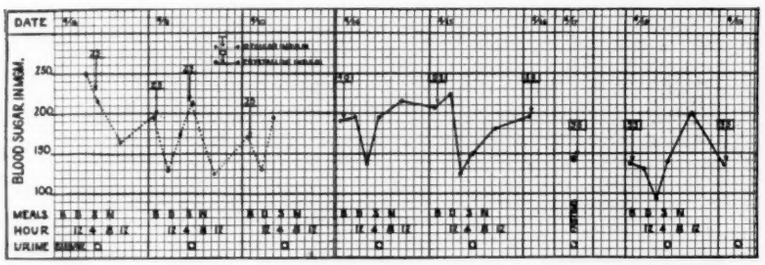


Chart 5.—A woman, aged 54, had a small ulcer on the right leg, which healed without difficulty. On diet 4 she showed adequate control of her blood sugar and no glycosuria on one daily dose of crystalline insulin.

The substitution of crystalline insulin for regular insulin caused no loss of control of blood sugar and consequently no glycosuria. We did not find it necessary to give supplementary doses of regular insulin to maintain this stability.

The resulting curves confirmed the observations noted in the average curves. The charts of patients receiving the three largest dosages of insulin are worthy of analysis.

Charts 4, 5 and 6 show the curves of patients receiving 50, 60 and 80 units of regular insulin daily in divided doses. Delayed absorption of crystalline insulin is shown by the fact that small doses of regular insulin produced a larger drop in blood sugar from 7:30 to 11 a. m. each day than was produced by doses of crystalline insulin from two to three times as large. In fact, following the crystalline insulin there was often the rise at noon, as noted in the average curves. With crystalline insulin there was a universal drop in the blood sugar from 11 a. m. to 2 p. m. which was not present when regular insulin was administered, even with a noon dose, as in chart 4. Thus crystalline insulin is slower in absorption, the peak of its action not being reached till six hours after injection; i. e., about 2 p. m.

While the blood sugar at 10:30 p. m. with one daily dose of crystalline insulin is often high, owing to the liberal carbohydrate content of the evening meal, to the nourishment taken at 8 p. m. and to the slow absorption of the insulin, there is usually a large drop in the blood sugar over night, whereas with regular insulin there is an invariable rise even with a supper dose. The constancy of this difference in the two preparations is striking. The regular insulin in cases of moderate or severe diabetes does not remain effective over night, while the nocturnal effect of crystalline insulin in lowering the blood sugar is marked. Apparently a single dose of crystalline insulin shows prolonged action for twenty-four hours or more.

It is noteworthy that there was not a single insulin reaction nor any discomfort to the patient following the administration of daily large doses of crystalline insulin. Even though the patient in chart 6 had a fasting blood sugar of only 103 mg. on the morning of May 8, he was given 60 units of crystalline insulin without any symptoms of hypoglycemia. At no time was there glycosuria.

The convenience and decreased discomfort accompanying a single daily dose of crystalline insulin in preference to multiple doses of regular insulin are highly acceptable to diabetic patients. The use of crystalline insulin in this respect merits further clinical study.

SUMMARY

The improved crystalline insulin used in this investigation was perfectly stable at room temperature.

The data obtained in comparing regular and crystalline insulins show them to be equally potent, as demonstrated by the daily average of all blood sugars.

An average of 280 blood sugar readings in complicated and uncomplicated diabetes shows slower absorption and more prolonged action of improved insulin.

Severe infections or an acidosis seems to favor a more rapid absorption of crystalline insulin.

Delayed absorption prevents insulin reactions following the injection of large doses of improved insulin, even when the fasting blood sugar is low.

The single morning dose apparently remains in effect during the succeeding night, as shown by the lowering of the blood sugar between 10:30 p. m. and 7:30 a. m.

One daily, large dose of crystalline insulin may adequately control the blood sugar of patients requiring two or more doses of regular insulin daily and maintain the patients aglycosuric.

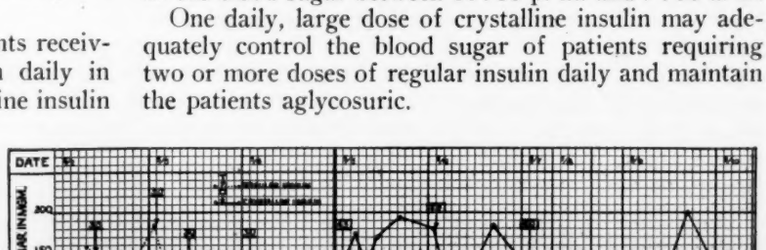


Chart 6.—A man, aged 65, had had diabetes for six years. A small ulcer on the plantar surface of the right foot healed quickly. Even though his fasting blood sugar on May 8 was only 103, he had no insulin reaction following a dose of 60 units of the crystalline insulin. This patient was on diet 2.

Our work was a comparative study and no attempt was made to improve the blood sugar curve with crystalline insulin.

The improved crystalline insulin is worthy of further clinical study.

Cook County Hospital — 4458 Madison Street.

Chewing the Food.—Such rules as that each mouthful should be chewed a given number of times are too arbitrary to be permanently helpful; a more rational rule is that each mouthful should be chewed until swallowing is entirely unconscious.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

Clinical Notes, Suggestions and New Instruments

MYELOPHTHISIC ANEMIA IN A CASE OF CARCINOMA OF THE STOMACH

EDGAR F. KISER, M.D.
Associate Professor of Medicine, Indiana University School of Medicine
AND
B. D. ROSENAK, M.D., INDIANAPOLIS

This report of a patient having carcinoma of the stomach with an unusual form of anemia has been prompted by a report of two similar cases made recently by Dr. Theodore R. Waugh.[1]

Clinicians are familiar with the usual picture of anemia due to gastric carcinoma. The vast majority of cases demonstrate the typical picture of so-called secondary anemia due to chronic blood loss. The factor of impaired nutrition enters into the production of minor degrees of anemia in those cases before actual loss of blood begins. It is thought that in cases in which there is an actual achylia gastrica this factor also plays an important rôle in disturbing the normal hematopoiesis. In most cases in which there is a more or less severe degree of anemia in cancer of the stomach, the etiologic factor of most importance is the chronic loss of blood from the ulcerated surface of the lesion itself. The degree of metastasis, according to Crohn,[2] has nothing to do with the severity of the anemia unless bone marrow metastases have occurred, as in the case herewith reported. However, Eusterman and Balfour [3] point out that there is a correlation between the degree of anemia and the extent of involvement of the stomach, and consequently the blood picture has some value as a prognostic sign. The severity of this type of anemia in cancer of the stomach varies greatly. The red blood cells may number 2,000,000 or less, but most cases at the time of diagnosis will be found to show a red cell count of from 3,500,000 to 4,000,000, and a hemoglobin of 40 to 70 per cent. The color index is always below 1 in this type of anemia. There is no feature of this blood picture to enable differentiation from the anemia due to chronic blood loss from any other cause.

A less common blood picture in cancer of the stomach is that which closely resembles addisonian anemia. This condition has been seen on a number of occasions in the past few years and always has aroused considerable debate as to diagnosis. In most of these instances in which a macrocytic anemia with a high color index is found, certain clinical features of the case will point the way to the correct diagnosis. Often the hematologic studies alone will not suffice, and only a thorough study of gastric contents, with determination of enzymes and a careful roentgen examination of the stomach, will reveal that such a case of anemia is due to or accompanied by carcinoma of the stomach. In several instances we have had such cases on liver therapy and obtained excellent reticulocyte response. In one case, seen three years ago, not only were the blood picture and reticulocyte response present but the patient also presented the clinical picture of posterolateral sclerosis. At present, three years after a sleeve resection of an adenocarcinoma of the stomach, he is apparently well and maintains a satisfactory blood picture on iron alone. It is never possible under such circumstances to feel absolutely certain that a single individual does not have both lesions. Nor can one dismiss the thought that the carcinoma has played some part in destroying the intrinsic gastric hematopoietic factor and is, in fact, the etiologic background for what is essentially a true pernicious anemia.

A third and much less common form of anemia engages our attention at present—so-called myelophthisic anemia, a severe grade of hemolytic anemia occurring in diseases which destroy the bone marrow. Metastatic carcinoma is an occasional cause of this type of anemia. Cancer of the breast, thyroid and prostate are most apt to metastasize to bone, but not infrequently this occurs in cancer of the stomach. For some unaccountable reason, bone marrow metastases may occur without producing this bizarre blood change, but when it does occur there should be no difficulty in classifying it. The significant morphologic changes in the blood include a marked diminution of red blood cells, correspondingly low hemoglobin content, marked anisocytosis and poikilocytosis, and a high percentage of polychromatophilic cells and nucleated forms. Myelocytes are frequently found in the circulating blood. Thus in these cases a very rapid destruction of blood cells, particularly the red cells, occurs and there is a marked increase in the number of immature cells present in the circulating blood. Waugh found an increased red cell fragility in his cases and felt that this factor played some part in their rapid destruction. The fragility test in the case herein presented was entirely normal. The mechanism of the destruction of the erythrocytes in these cases is unknown. Waugh states that a "toxin" produced by the cancer cells may be the hemolytic factor. The logical explanation for the abundance of young cells in the blood is that a compensatory stimulation of the uninvolved areas of bone marrow occurs. This may be due to mechanical or chemical irritation of the marrow neighboring the metastatic nodules. Pepper and Farley [4] state that in the terminal stages of this type of anemia an actual aplasia of bone marrow occurs with an absolute cessation of hematopoietic activity. It is not often that an individual lives until such bone marrow destruction extends sufficiently to produce an absolute aplasia. However, it is conceivable that a considerable degree of aplasia of bone marrow may be produced in cases of widespread carcinomatosis. It seems reasonable, therefore, that an aplastic element might also play a part in the picture of myelophthisic anemia, in that destruction of marrow occurs out of proportion to compensatory activity of uninvolved hematopoietic tissue.

Another feature of the present case which may or may not support the foregoing theory is the terminal disappearance of platelets from the circulating blood. This may be due to a failure of formation or to a rapid destruction of these elements by the same toxin that destroys the red blood cells.

REPORT OF CASE

A white man, aged 38, a plumber, first consulted his physician Nov. 24, 1935, when he complained of mild backache, weakness and fever. At this time he was sent to bed and treated for influenza. However, he did not respond to treatment, continued to lose weight, became weaker, and developed dyspnea. He was seen in consultation in his home December 24, one month after the onset of his illness. He was found to be cachectic, profoundly weak, very short of breath, and definitely flushed.

Physical examination revealed his temperature to be 101 F. and there were signs of fluid in the left side of the chest. Examination of the abdomen disclosed nothing. The patient did not appear to be profoundly anemic. At this time the diagnosis of tuberculosis and possibly tuberculous pleurisy was made, and he was sent to a hospital.

At the time of the initial visit, no significant data concerning family illnesses could be ascertained, and the patient stated that his health had been excellent until the onset of the current illness.

When admitted to the hospital, he was found to be mildly jaundiced and his spleen was definitely palpable. There were no gastro-intestinal symptoms. The nails and mucosae appeared very pale, but his skin did not show a marked anemia. His pulse was 140, respiration 30, and temperature 100.

Laboratory examinations on the day of admission showed the urine to be entirely normal and the Wassermann and Kahn reactions to be negative. A roentgen examination of the chest revealed a general increase in density of both bases, a small amount of fluid in the left base, and an area of increased density in the right lower lobe, which latter the roentgenologist stated had the appearance of a small metastatic nodule but which he said was probably due to an area of exudation. In this instance, caution prevented the making of a brilliant roentgen diagnosis.

There was very little response following two transfusions of 500 cc. of citrated blood. Several blood counts were made, but the one made December 28 is representative: hemoglobin

1. Waugh, T. R.: Hemolytic Anemias in Carcinomatosis of the Bone Marrow, Am. J. M. Sc. **191**: 160-169 (Feb.) 1936.
2. Crohn, B. B.: Affections of the Stomach, Philadelphia, W. B. Saunders Company, 1927.
3. Eusterman, G. B., and Balfour, D. C.: The Stomach and Duodenum, Philadelphia, W. B. Saunders Company, 1935.
4. Pepper, O. H. P., and Farley, D. L.: Practical Hematological Diagnosis, Philadelphia, W. B. Saunders Company, 1933.

28 per cent, or 4.21 Gm.; erythrocytes 1,690,000; anisocytosis marked; poikilocytosis marked; nucleated cells frequent; polychromatophilia marked; reticulocytes 11 per cent; leukocytes 6,000; polymorphonuclears 6 per cent; small lymphocytes 17 per cent; large lymphocytes 26 per cent; staff cells 33 per cent; basophils 3 per cent metamyelocytes 10 per cent; myelocytes 3 per cent; monocytes 2 per cent; platelets too few to count; color index 0.82; coagulation time 10 minutes; bleeding time 45 seconds; fragility of red cells on initial hemolysis 0.44 per cent sodium chloride; on complete hemolysis 0.34 per cent sodium chloride. Clot retraction occurred within twelve hours. Red cell sedimentation was 0.1 mm. per minute (normal, according to the method of Rourke and Ernstene). The van den Bergh test gave a delayed positive reaction, indirect positive reaction. Quantitative serum bilirubin was 0.5 mg. Blood cultures were negative.

As stated before, the patient did not respond to blood transfusions but declined very rapidly and died on the fifth day after admission to the hospital.

Autopsy showed an adenocarcinoma of the stomach situated on the posterior wall near the lesser curvature. The lesion was 6 cm. in diameter and protruded about 1 cm. into the lumen. The surface of this lesion was not eroded or ulcerated. The nodes along the lesser curvature and those throughout the mesentery as well as those following the aorta and its branches were markedly enlarged and firm. The liver was enlarged and was studded with metastatic nodules. The spleen was enlarged but was not involved in the metastatic process. The left adrenal gland showed numerous firm nodules throughout. The lower lobes of both lungs contained microscopic areas of carcinomatous infiltration. There were very few areas that might have been large enough to cast the shadow seen on the x-ray films. Unavoidable circumstances made it impossible to obtain bone marrow specimens, but such sections would only have added corroborative information to this case, which completely demonstrates the myelophthisic type of anemia in a patient with rapidly metastasizing carcinoma arising in the stomach.

SUMMARY

There are two common forms of anemia seen in cancer of the stomach. One of these is a simple form of secondary anemia due to chronic blood loss and undernutrition; the other is one that bears much similarity to true pernicious anemia.

A case of carcinoma of the stomach presented a rare form of anemia due to metastatic involvement of bone marrow. The mechanism of this so-called myelophthisic anemia is not definitely understood but presents elements of rapid destruction of red blood cells, a compensatory stimulation of hematopoietic activity, and probably some degree of aplasia.

226 Hume Mansur Building.

RECTAL STRICTURE COMPLICATING DELIVERY

REPORT OF A FATAL CASE

CECIL D. GAINES, M.D., AND JAMES F. McDOWELL, M.D.
BIRMINGHAM, ALA.

A review of the recent literature fails to reveal any articles dealing with the problem of rectal stricture complicating delivery, yet the great mass of rectal disorders that the average physician meets in general practice should warrant giving a severe rectal stricture the respect that is its due in regard to pregnancy and the delivery of that pregnancy. We feel that the presence of rectal stricture in the pregnant patient should be regarded with grave apprehension.

The principal point in the relation which the presence of a stricture might have on the delivery of the pregnancy depends entirely on the degree of the stricture. A history of constipation over a long period of time associated with the presence of "pencil sized" stools should warn the obstetrician of impending difficulty. Small strictures, or "bands" in which there is no decrease in the size of the stools or in which there is no decrease in the size of the rectal canal are of no consequence and may be disregarded. But when there is a definite thickening of the rectal wall, and particularly of the rectovaginal septum, a complete study of the condition should be made, preferably before the onset of labor.

REPORT OF CASE

S. V., a white woman, aged 19, admitted to the labor room in active labor, dated the onset at about twenty hours before admission with rupture of the membranes thirty minutes before admission. The past history was essentially negative except for the presence of "rectal trouble" for several years. She had had no antepartum care, owing principally to the fact that she had never menstruated. She stated that she was not cognizant of being pregnant. On examination she was found to be in very active labor and her general condition did not appear to be good. External pelvic measurements were within normal limits; no internal measurements were taken. Routine rectal examination revealed a very tight rectal stricture which would admit the index finger with the greatest difficulty for a distance of about 1 inch (2.5 cm.). There was involvement of the entire wall of the rectum, extending as far as the finger could reach. There was a definite thickening of the rectovaginal septum. Internal hemorrhoids protruded with each labor pain. The fetus was in the left occipito-anterior position with fetal heart tones well heard in the left lower quadrant of the abdomen. Approximately three and one-half hours after admission the fetal head was crowning, but the patient seemed to be making little if any progress. She was prepared for delivery. Tucker-McLean forceps were applied and a mediolateral episiotomy done; there was marked bleeding from the incision as the result of the unexpected large size of the vulvar varicosities. Strong traction with the forceps failed to bring the head any farther down. Version and extraction was then decided on as the most advisable procedure. Except for some difficulty in replacing the head the version was comparatively easy, but after the delivery of the chin the obstruction was sufficient to stop the extraction. With a great deal of traction the head was finally delivered rather suddenly. The child was a normal full-term living male weighing 6 pounds 7¾ ounces (3,062 Gm.). The episiotomy was repaired in spite of the patient's semishocked condition, and she was transferred to the ward when it was thought safe. She reacted only once from the shock and died approximately five and one-half hours after delivery.

Postmortem examination revealed a moderate amount of thick dirty brown fluid with a fecal odor in the pelvis and dependent portion of the upper part of the abdomen. In the rectovaginal excavation there was a transverse laceration through the pelvic peritoneum and underlying anterior wall of the rectum with a direct communication of the lumen of the latter into the peritoneal cavity. There was a stricture of the rectum two phalanges above the anus with a considerable narrowing of the lumen of the remaining portion of the rectum; 8.4 cm. above the anus was a laceration of the anterior and lateral portions of the upper part of the rectum, with an opening communicating directly with the peritoneal cavity. The mucosa of the rectum and sigmoid colon was irregularly scarred and covered with scattered deep purple hemorrhagic areas. The wall was moderately indurated and the lumen definitely narrowed. A diagnosis of chronic ulcerative colitis and sigmoid diverticulitis was made.

It was apparent from the clinical history, physical examination, difficulty in delivery, and the postmortem examination that the direct cause of death in this case was the presence of a severe rectal stricture. The method of handling the delivery would have undoubtedly been cesarean section, with probable sterilization, had it been realized beforehand that the dystocia offered by the rectum could have been so great. We feel that in this type of case a section is definitely indicated and that if the diagnosis is made prior to the onset of labor a great deal of danger may be averted.

SUMMARY

1. In a fatal case of rectal stricture complicating delivery the dystocia caused by long-standing chronic ulcerative colitis was sufficient to cause rupture of the rectum with delivery of the head.

2. Cesarean section is indicated in cases of severe rectal stricture.

3. The history of "rectal trouble" should be studied thoroughly during the antepartum care of the pregnant woman.

620 South Twentieth Street.

Special Article

THE IMPORTANCE AND ADVANTAGES OF PRESCRIPTION WRITING IN MEDICAL PRACTICE

E. FULLERTON COOK, PH.M.
Chairman of the Committee of Revision of the Pharmacopeia of the United States
PHILADELPHIA

This is one of a series of articles written by eminent clinicians for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

In connection with the Eleventh Revision of the United States Pharmacopeia, containing the new official materia medica, a series of articles are appearing in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. The authors have been asked to express their opinions, without bias or influence, concerning the most effective treatment of certain diseases. Although their attention has been called to the official list of medicinal substances, they will be free to disregard these agents if in the interests of efficacious therapy other drugs should be mentioned. Any remedies that come to light through these writings can then be considered and investigated with the view of possible inclusion in the Pharmacopeia through "interim revisions."

THE SELECTION OF U. S. P. MEDICINES

The therapeutic agents included in the latest Pharmacopeia were selected by a subcommittee consisting of eighteen physicians and five pharmacists. The physicians were those named by the medical members of the U. S. Pharmacopeial Convention, primarily for their special qualifications for deciding the scope of the U. S. P. so far as it represented therapeutic agents. The pharmacists contributed information concerning the extent of use of substances but were specially responsible for pharmaceutically necessary items such as were needed to manufacture or test the quality of the official medicines.

The principle governing the selection of medicines was exclusively that of therapeutic merit, as demonstrated through biologic and clinical experience. At the time of selection, even such questions as their status with respect to trademark or patent control were not to be considered. That the new Pharmacopeia might adequately represent the best therapeutic agents known to modern medicine, the former official list was carefully reviewed and about 100 substances eliminated as obsolete or unnecessary. Then all outstanding items in the newer materia medica were studied and fifty-four therapeutic agents were added to the official list.

THE U. S P. CONTAINS MOSTLY SINGLE THERAPEUTIC SUBSTANCES—NOT COMBINATIONS

Another guiding principle influenced the selection of the U. S. P. XI titles. This was a theoretical ideal which the committee has maintained, namely, that only simple or basic substances or at least only concentrates of these, and no polypharmacal mixture, should receive Pharmacopeial recognition. This is based on the teaching that the physician should be free to exercise skill and judgment in the selection and combining of each medicine, that it may exactly meet the needs of his individual patient. It also affords an opportunity to the physician to employ one drug of known physiologic activity, if he so wishes, or to combine with it an adjuvant or such adjuvants as he believes desirable.

A PRESCRIPTION SHOULD BE DISTINCTIVE

While the ideal of medical practice is to use a single therapeutic agent of known physiologic value, it is often advisable to employ a suitable vehicle and to vary this so that the medicine may be distinctive. This applies to all forms of medication, such as liquids, powders, capsules and ointments. A pleasant flavor, an odor that suggests something other than a medicine, an added color are all legitimate enhancements to a prescription and make the medicine less likely to be duplicated. Those who deal with the sick are conscious of the influence of suggestion; a belief in the physician and his treatment is a powerful influence for relief and cure.

ADVANTAGE OF COOPERATION BETWEEN THE PHYSICIAN AND THE PHARMACIST

If the physician in practice is unfamiliar with suitable flavors, colors and vehicles, he has a tendency to order ready made preparations rather than to write a prescription containing the ingredients desired. Other factors that sometimes lead to "ordering" in place of "prescribing" are complexity of the pharmaceutical problem involved or lack of information as to dosage, solubility, chemical reactions and other factors.

In these strictly pharmaceutical problems the skilled pharmacist can often help the physician. He can also supply information concerning manufactured medicines, and cooperation with a competent pharmacist will frequently prove beneficial to the patient.

The intensive training of the physician and the elaborate machinery for preparing, standardizing, checking and distributing medicinal substances are all animated by the needs of a patient. To meet this situation there comes the physician, skilled in diagnosis, familiar with the most effective methods of treatment and having at his command a knowledge of the action of medicinal substances and knowing when they are indicated. But his medical skill frequently cannot function effectively if there are not available the carefully prepared and standardized ingredients for his prescriptions, already produced by expert pharmacists, chemists, bacteriologists or biologists, and made available through the pharmacist in the hospital or the community.

IMPORTANCE OF THE SCIENTIFICALLY CONTROLLED MANUFACTURING LABORATORY

In the background there must stand today the manufacturing laboratories, with efficient equipment and rigid control over every step of manufacture. These must produce standard inorganic and organic chemicals, such as ether, potassium iodide and sodium salicylate, complex synthetics such as arsphenamine, biologicals such as diphtheria antitoxin and rabies vaccine, biologically standardized pharmaceuticals, including preparations of digitalis and pituitary, sterile products for parenteral administration and the hundreds of other needed chemicals and pharmaceuticals.

The trained pharmacist serves as a liaison officer in the hospital, the medical center and the community. His specialized knowledge concerning the available medicines should be of inestimable value to the physician in both the selection of medicines and their combination.

THE PRESCRIPTION FOR THE INDIVIDUAL

The prescription written for the individual patient is an important link in a perfected service. An original prescription shows evidence of professional skill and is not a product with which the patient is already familiar through its display in the type of medicine store where no professional knowledge is present and where such standards must necessarily be low.

The latter situation is worthy of serious consideration, for the patient is likely to question the justification for a doctor's fee when it results in what may appear to be a "patent medicine" type of treatment. Physicians are also realizing that the patient is almost certain to recount his or her experience when talking to friends, perhaps to the discredit of the doctor. Even the naming of such trademarked medicines under these circumstances often leads those who hear the discussion to buy the same medicine to relieve self-diagnosed symptoms. The alarming increase in the use of hypnotics, without medical advice, illustrates this danger.

The use of abbreviated official titles written into a prescription and with a "non rep." order controls the situation, while the suggestion to "buy it at the drug store" opens wide the door to self medication.

OFFICIAL MEDICINES NOW LARGELY USED

In proposing the use of official medicines on prescriptions it is not being suggested to physicians that they seriously modify the present-day custom of most doctors. In a scientifically conducted survey of the actual ingredients used by physicians in their prescriptions during 1931-1932, a study covering typical communities throughout the United States and including 121,294 prescriptions, Gathercoal [1] reported that 65.19 per cent of the ingredients in these prescriptions were official in the U. S. P. X, 7.92 per cent were in the National Formulary, 16.05 per cent were proprietary specialties and 10.84 per cent were unofficial items. About the same time the author of this paper found by a study of the catalogues of physicians' supply houses that a preponderant proportion of the ingredients used in their formulas were official in the U. S. P.

The Pharmacopeia of the United States was founded by physicians in 1820 as a therapeutic guide to the profession. It has endeavored to maintain that position for more than a hundred years. Its preparations were the basis for the teaching of therapeutics in medical schools for almost a century and now they constitute the large majority of those therapeutic agents recommended by the American Medical Association in Useful Drugs as a present-day therapeutic guide for medical schools.

PHYSICIANS AND THE PHARMACOPEIA

The Pharmacopeia invites the physicians of the country to assist in maintaining it as a reliable guide to the medical profession in the field of therapeutics. If items now official are unreliable they should be deleted; as important new remedies are developed these should find a place in the Pharmacopeia by "interim revision."

It is believed that, with a study of the ingredients official in the new Pharmacopeia, especially when supplemented by the National Formulary tablets, ampules and elixirs of U. S. P. drugs, including such preparations as Elixirs of the Bromides, of Barbital, Phenobarbital and Aminopyrine respectively, and the Sprays and Jelly of Ephedrine, physicians will find a wide range of medicines for practically every therapeutic need.

OFFICIAL MEDICINES IN HOSPITAL TREATMENT

Emphasis should also be placed on the restriction of routine hospital treatment to official medicines whenever possible, since this has been demonstrated to be a policy which is scientifically and economically sound.

PRESCRIPTION WRITING BY HOSPITAL INTERNS

This program for the hospital has within it another possibility of far-reaching significance. It is realized that the medical student has little opportunity in his crowded curriculum to become familiar with official titles or even to gain practice in prescription writing. Insufficient information and training in these two fields as well as the use of certain types of hospital formularies and lack of cooperation between the house and visiting medical staffs help to explain the failure to write more prescriptions for official medicines. This is being recognized by a number of hospitals, and both medical and surgical interns are being given regular training in the use of official medicines and in prescription writing. The appreciative response, where this course has been well conducted, is gratifying and is apparently justifying itself by the increased efficiency and ability of the younger physicians having this added training. The medical staffs of many hospitals have developed their own "formulary" as an aid in the efficient and economic use of medicines within the hospital. The prescriptions in such a "formulary" should never be given by numbers, as this practice has led to both carelessness and mistakes. In the compiling of such a "formulary" the official titles of drugs, chemicals or preparations, or their official abbreviations, should be used so that the younger physicians on the staff may become increasingly familiar with these established medicines.

THE PRICE OF A PRESCRIPTION

The price of a prescription is no small item for consideration in the total cost of medical care. It should be the basis for a complete understanding and must be established on a sound and economically correct foundation.

It is proper that the patient should pay for the medicine and that it should not come out of the physician's fee, for that is not economically sound and leads to numerous abuses. Many physicians today are being persuaded to start the practice of office dispensing. There are conditions in which this is justified, as in a country district where there are no prescription-filling facilities; but that it introduces the possibility of many complications must be conceded, and most physicians return to prescription writing as soon as financial pressure is relieved.

However, to return to the price to be charged for the prescription: when the pharmacist is called on to utilize his professional skill and equipment in supplying the medicine ordered by the physician or when he has prepared the medicines beforehand in his laboratory, using his training and equipment, there is justification for including a reasonable professional fee in the price to be charged the patient.

THE REFILLING OF PRESCRIPTIONS AND THE GIVING OF COPIES

An argument sometimes advanced against the writing of prescriptions is based on the belief that the patient often continues the use of the medicine long after it

1. Gathercoal, E. N.: The Prescription Ingredient Survey, published by the American Pharmaceutical Association.

was intended by the physician by having the original prescription refilled and by even giving copies of the prescription to friends.

If a physician prefers that the prescription shall not be refilled except on his order, it is the common practice to add to the prescription the abbreviation "non rep." and this injunction will be honored by the pharmacist.

This "non rep." order should never be printed on a prescription blank. It has a different significance when written on the prescription by the physician. The pharmacist can assist by attaching a special label to the filled prescription indicating that it is nonrefillable. In such cases "a copy" of the ingredients should not be placed on the package.

SUMMARY

The welfare of the patient is often aided by the administration of a properly selected medicine. A distinctive prescription, written for the needs of a specific patient and using official drugs or preparations whenever these are available, is desirable.

The skilled professional pharmacist can often be helpful in the selection and combination of medicines.

The judicial use of the "non rep." order on prescriptions and the employment of official titles will assist in the control of objectionable self medication.

Forty-Third Street and Woodland Avenue.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary.

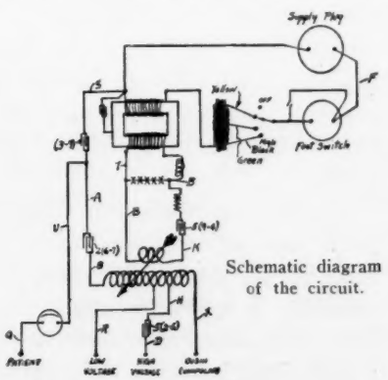
MODEL J DIATHERMY AND COAGULATOR ACCEPTABLE

Manufacturer: The Liebel-Flarsheim Company, Cincinnati.

This machine is recommended by the manufacturer for medical and surgical diathermy. The unit is mounted in a cabinet of walnut finish and is equipped with three voltage taps: low, high and oudin. The unit weighs about 60 pounds.

At the request of the Council, the manufacturer submitted data concerning tests of the machine for power input and output, and for its spark gap and transformer temperature rise. The results recorded in the data were in agreement with the observations of the Council's investigator and were in conformity with the standards for diathermy machines previously established by the Council.

Model J diathermy and coagulator.



Schematic diagram of the circuit.

The unit was tested for seven months in a clinic acceptable to the Council, and the investigator reported that the machine coagulates, desiccates and fulgurates satisfactorily and develops sufficient heat for use in medical diathermy.

In view of the favorable report, the Council voted to include the Model J Diathermy and Coagulator in its list of accepted apparatus.

Council on Pharmacy and Chemistry

PRELIMINARY REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT.

PAUL NICHOLAS LEECH, Secretary.

SMALLPOX VACCINE (From Chick Chorio-Allantoic Membrane)-LILLY

Eli Lilly & Co. requested Council consideration of its smallpox vaccine made by using chick chorio-allantoic membrane instead of the usual calf lymph. The firm supplied the following statement of the method of preparation:

"Chick embryos of about fourteen days are used. After sterilizing the surface of the eggshell, a minute opening is drilled and the chorio-allantoic membrane inoculated with sterile seed vaccine virus from a syringe, the needle of which is introduced through the shell puncture. The opening is sealed with paraffin, and the inoculated egg returned to the incubator. After an incubation period of seventy-two to ninety-six hours, the chorio-allantoic membrane is exposed, harvested, and tested for sterility. Only sterile membranes are used in the preparation of the vaccine. These are pooled into a sterile container and a 50 per cent glycerin diluent added. Grinding to a very fine, homogeneous emulsion is effected by a high-speed electric grinder. Sterility, safety, and potency tests are run. After filling the vaccine into capillary tubes, sterility and potency are checked."

The firm holds that this method of preparation eliminates the hazard of bacterial contamination and gives an improved preparation of uniform potency, diminished virulence and immunizing quality at least as high as that of the vaccine prepared from calf lymph.

In support of the claim of equal potency with that of calf lymph the firm presented the following comparative chart of potencies of the finished product as filled into the capillary tubes and placed on the market:

Comparative Filling Potency Chick Embryo and Calf Smallpox Vaccine

Item and Lot Number	1-100	1-1,000	1-3,000	1-10,000
Chick Vaccine				
No. 922716	5+	3+	1+	1+
No. 922715	5+	4+	3+	3+
No. 922713	5+	4+	2+	2+
No. 922714	5+	4+	2+	2+
No. 922712	5+	3+	2+	1+
Calf Vaccine				
No. 913966-2	4+	3+	Not run	2+
No. 913966-3	4+	3+	Not run	1+
No. 916388-1	4+	4+	Not run	2+
No. 916388-2	4+	3+	Not run	2+
No. 918191-1	4+	4+	Not run	2+
No. 902731-4	4+	4+	Not run	3+

As evidence for the clinical effectiveness of the product, the firm presented the following reports of its use by Drs. Frank D. Ryder and Carl J. Lund of Minnesota, who have kindly given permission for their use in this preliminary report:

"SMALLPOX VACCINATION
Grand Island Public School System
November, 1935

Number Vaccinated	3,356	
Elementary Schools, Teachers and Students		1,968
Junior and Senior High Schools, Teachers and Students		1,388
	3,356	3,356
Reactions		
Positive takes, entire system	2,492	
Negative—no takes, entire system	864	
	3,356	
The percentage of positive reactions in elementary schools (up to 7th grade)		91.3%
Immune reactions same age group		1.9%
Inherited immunity—no reactions		6.8%
In Junior and Senior High Schools (7th grade to 12th grade, incl.) the percentage of positive reactions		50.1%
Immune reactions same age group (students who had been vaccinated within seven years and those who had had smallpox)		49.9%"

Dr. Lund reported as follows:

"It may be of interest to know that I recently vaccinated 118 pupils in our local grade and high school.

"I used your chick chorio-allantoic membrane smallpox vaccine and had 100% 'takes' on those who had primary vaccinations.

"I used the multiple pressure method (40-50 pressures)."

The Council considered the evidence offered for Smallpox Vaccine (from Chick Chorio-Allantoic Membrane)-Lilly to be favorable but insufficient as yet to justify its acceptance for inclusion in New and Nonofficial Remedies. The Council therefore postponed consideration of the product to await the development of further confirmatory evidence of its value.

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SATURDAY, SEPTEMBER 19, 1936

SELENIUM POISONING IN THE UNITED STATES

Selenium poisoning, formerly called "alkali disease," has been discussed before in our editorial columns.[1] It was first recognized in 1857 by Madison[2] on the Missouri River in what is now Gregory County, S. D., among a squadron of horses. Mayo[3] reported its occurrence in certain sections of Kansas in 1890-1891, and the Wyoming Agricultural Experiment Station observed it in horses in Carbon County, Wyo., in 1893. Peters[4] in 1897 and 1904 announced its occurrence among cattle, horses, pigs and chickens in Boyd County, Neb., and Lipp[5] described it in South Dakota in 1921. In 1928 Kurt W. Franke of the South Dakota State College of Agriculture at Brookings learned that animals consuming vegetation growing on particular areas developed "alkali disease." He found that grain which had been grown on "alkalied" farms and fed to white rats was very toxic and he attributed the injurious effects to a definite toxic constituent or group of constituents. In 1931 Henry G. Knight of the Bureau of Chemistry and Soils, United States Department of Agriculture, suggested that traces of selenium absorbed by plants from the soil might be responsible. Analysis of a sample of toxic wheat by W. O. Robinson revealed a content of from 10 to 12 parts per million of selenium. These important discoveries have stimulated much investigation, especially by the Bureaus of Chemistry and Soils, Plant Industry and Home Economics of the Department of Agriculture at Washington and the agricultural experiment stations of South Dakota and Wyoming. The evidence obtained definitely incriminates selenium and indicates that the so-called alkali disease of live stock may be due to traces of selenium in indigenous grains and forage.

Selenium, with an atomic weight of 78.9, is a relatively rare allotrophic element having many of the physical and chemical properties of sulfur and tellurium. It is widespread in the earth's crust, occurring in small quantities in the combined and free state, mostly associated with native sulfur, sulfate or metallic iron. It combines with many elements, such as oxygen, hydrogen, fluorine, chlorine and bromine, and most metals. Its chief commercial usefulness lies in the glass, copper, steel, ceramic and photographic industries and in the process of vulcanizing rubber and insuring noninflammability to electric cords.

The "alkali" disease is prevalent in the North Central Great Plains of the United States, causing losses among cattle, horses, pigs, sheep and chickens as the result of the ingestion of selenium-bearing vegetation growing on arid or semiarid grazing lands and farms. Cereal-producing areas are involved, for the most part certain regions in South Dakota and Wyoming, and it is thought that North Dakota, Kansas, Montana, Nebraska, Colorado and New Mexico may be affected.

The Cretaceous and Eocene geologic formations, deposited about 120 million and 60 million years ago, are the selenium-bearing strata in this section of the country, particularly the Pierre formation, where from traces to 100 parts per million of selenium have been found. Soils derived from such strata and vegetation growing on such soils contain selenium in varying quantities. The total area of soils concerned is enormous, but not all the vegetation growing on them is toxic. Byers[6] believes that seleniferous areas exist in at least four continents. If leeching has not occurred, all soils derived from pyritiferous parent materials contain selenium. However, water in these toxic areas contains the element only in traces. The investigations of the United States Bureau of Agriculture and of the South Dakota State College of Agriculture have revealed the presence of selenium in foods in the "alkalied" areas, such as milk, eggs, corn, wheat, barley, rye, string beans, lettuce, cabbage and turnip leaves in amounts varying from 0.3 to 150 parts per million of selenium, data which indicate the gravity of this problem, at least locally.

The toxicity of selenium compounds toward bacterial, plant and animal life varies with the ionic state. Selenite is more toxic than selenate, and reduced selenium is almost nontoxic. Selenium and arsenic possess similar toxic effects. Selenium is readily absorbed but is rapidly reduced by all life. The toxicity of vegetation depends on its selenium content, and the absorptive power of plant life for selenium depends on the degree of rainfall, leeching, weathering, composition of the soil, the geological outcrop on which the plant material grows, the species of plant, and the amount of available sulfur or sulfate in the soil. Any soil containing more than 0.5 part per million of selenium and

1. Selenium Problem, editorial, J. A. M. A. **104**: 50 (Jan. 5) 1935.
2. Madison, T. C.: Sanitary Report—Fort Randall, in Coolidge. R. H.: Statistical Report on the Sickness and Mortality in the Army of the United States, January 1855 to January 1860, 36th U. S. Cong., first session, Senate Ex. Doc. **52**: 37, 1860.
3. Mayo, N. S.: Bull. 24, Kansas Agricultural Experiment Station, 1891.
4. Peters, A. T.: Nebraska Agricultural Experiment Station Annual Report **17**: 13, 1904.
5. Lipp, C. C.: Ohio University Veterinary Alumni Quarterly **10**: 54, 1922.
6. Byers, H. G.: Selenium Occurrence in Certain Soils in the United States with a Discussion of Related Topics, Technical Bull. 482, U. S. Dept. Agriculture, August 1935.

any vegetation containing 5 parts per million is potentially dangerous.[6] As shown by the studies of Franke,[7] in the plant the selenium toxicant exists in the protein fraction in an unknown organic combination and may be removed by mercury bichloride precipitation.

Whether animals are fed with inorganic selenium compounds or with the natural plant toxicant, the pathologic and symptomatic features resemble closely those encountered among animals in the toxic areas. Necrosis and regeneration of the hepatic parenchyma with extensive periportal fibrosis and resulting cirrhosis combined with hemorrhages and secondary inflammatory reaction in the liver and kidneys are the primary pathologic features. Reduced selenium is found in the liver and spleen, and compounds of selenium are found in all tissues, secretions and excretions. Cattle, horses, sheep and pigs show erosions of the ends of the weight-bearing bones, with hoof abnormalities that considerably impair locomotion. Malaise, anorexia, stunted growth, loss of body hair, loss of weight, emaciation, impairment of reproductive power and severe anemia develop, to be followed by exhaustion, toxemia and death. The poisoning may be acute, in which case it is called blind staggers. Chickens show a decided impairment of fertility; if the eggs hatch the young do not live long, and monstrosities occur among them frequently. It is significant that Franke succeeded in producing similar monstrosities in chicks by the injection of selenium salts into fertile eggs. The symptoms encountered experimentally in the guinea-pig and the white rat do not essentially differ from those in other animals.

Even if removed from the toxic range and fed wholesome forage, selenized cattle do not usually recover their normal health. The stunting of growth in calves is distinct and continued, and in cattle the damage to the kidneys and liver seems to be permanent. Franke noted that rats fed on toxic grains for as short a period as ten days showed a lack of recovery, growth disturbances and typical pathologic changes even when fed a control diet for 165 days.

An evaluation of soil treatment with sulfates is indicated especially in the light of the work of Hurd-Karrer,[8] who observed that an adequate sulfur content of the soil may reduce the toxic influence of selenium.

"Alkali disease" is essentially an agricultural and veterinary problem of local concern. The danger to public health seems to be relatively slight, owing to the low content of selenium in the great portion of commercial crops and the high dilution of toxic grains in the general market. So far human selenium poisoning has not been reported in the toxic areas, but because of occurrence among various kinds of animals there is no reason to believe that man is immune. This aspect of the problem is now under investigation.

7. Franke, K. W., and others: Monstrosities Produced by the Injection of Selenium Salts into Hen's Eggs, Anat. Rec. **65**: 118 (April) 1936.

8. Hurd-Karrer, Annie M.: Inhibition of Selenium Injury to Wheat Plants by Sulfur, Science **78**: 560 (Dec. 15) 1933.

EPIDEMIC AMEBIC DYSENTERY

Studies of the Chicago outbreak of epidemic amebic dysentery of 1933 are now accumulated in a special bulletin[1] issued by the United States Public Health Service. The epidemiology, which constituted one of the most important aspects of the general situation, is reported in considerable detail. This epidemic was the first recognized water-borne outbreak and the only known extensive epidemic of this disease in a civilian population. Approximately 8,500,000 out of town visitors came to Chicago during the period of the epidemic, with resulting congestion of the downtown hotels and public eating places. Two large neighboring downtown hotels having to some extent a common water supply were chiefly involved. During the epidemic period approximately 160,000 persons had contact with these hotels. During the year from June 1, 1933, to June 30, 1934, an obviously incomplete total of 1,409 cases were brought to light. More than two thirds of those infected were out of town visitors to the city. The active onset of symptoms generally occurred after the visitors had returned to their homes; hence amebic dysentery so acquired was reported from more than 400 cities scattered in forty-three states, the territory of Hawaii and three Canadian provinces. The average interval between exposure and report of illness to the Chicago board of health was three months, the long delay being due to various factors. There was no evidence that any active focus existed other than that of the two hotels, but in one of the hotels the general incidence of infection was higher than in the other. Except at the beginning and end of the epidemic period, from June 1 to Dec. 31, 1933, infections were being spread almost continuously but with marked variation in the risk of exposure at different times. In general, the more prolonged the exposure at the hotel, the greater was the hazard of infection. Ten per cent of those apparently infected within the hotels gave no record of eating at either of the two hotels, and almost all of these stated specifically that they did not eat in the hotel at which they stayed. All, however, presumably drank water there. The age, occupation and socioeconomic status of the hotel guests infected corresponded with those of visitors to these two hotels. Evidence was not found of variations in sex susceptibility. The incidence of carriers among employees of the two hotels was respectively 37.8 and 47.4 per cent. Repeated examinations of employees indicated that infestations with Endamoeba histolytica were taking place during the epidemic. Vigorous measures directed to the prevention of the spread of infection by carriers among food handlers were ineffective. The opinion was reached that the principal if not the sole means of spread of this epidemic was through water polluted in one of the hotels. A contributing factor, however, was the progressively increasing number of carriers among

1. Epidemic Amebic Dysentery: The Chicago Outbreak of 1933, Bull. 166, National Institute of Health, U. S. Treasury Department, Public Health Service, Washington, D. C., 1936.

employees and probably among guests who remained for longer than the average stay.

Study of the engineering features of the epidemic was particularly productive of results. Thus, it was found that pressure variations in the different parts of a hotel plumbing system are more marked than is customary in a city street distribution system, because of the height of the building; hence hazards from lack of pressure or negative pressure are more liable to occur inside the building than outside. Two major sanitary defects were found, namely, cross-connections between sewer 2 and the condensers and a sewer leak round a wooden plug over the cooled water tank in the same hotel. Several important points were brought out in the investigation: Regulations for building cross-connections, in order to be enforced, must be backed by an adequate and experienced inspection force; there is great need for education of engineers, architects, designers, equipment manufacturers, installation artisans and operating personnel having to do with water supply, drainage and the sewage disposal systems of large buildings relative to the hazards of cross-connections; the secondary use of water in an institution may involve potential hazards of pollution, and therefore any secondary system should be kept entirely separate from the main water supply system. The installation of new or additional plumbing fixtures in a building without providing for the extra load on the drainage system may cause serious flooding of the sewers. Sewers operated under pressure require special construction, especially of joints, to prevent leakage. Plumbing defects of any character should be promptly and effectively repaired. Water storage tanks should be effectively covered.

The clinical aspects of the epidemic also were studied, as far as allowed by the wide geographic distribution. That the disease is not exclusively a tropical disease has been effectively impressed by the outbreak. It is therefore a clinical entity that must be considered in differential diagnosis in all regions. Not alone may epidemic cases be encountered, but endemic infections have been found to be more widespread than generally supposed. It may simulate a variety of clinical conditions, such as colitis, appendicitis, malignant conditions of the colon and surgical conditions involving the rectum. Specific therapy proved to be remarkably effective in the epidemic cases, but nonspecific measures were usually disappointing and surgical intervention often disastrous.

The thoroughness of the investigation of this widespread epidemic furnishes a notable example of what should be done in preventive medicine. It can scarcely be doubted that, had the knowledge existed and had such knowledge been put into effect prior to the disaster of 1933, more than a thousand serious illnesses would have been prevented. It is certainly important that the engineering and sanitary information gleaned from this epidemic be applied immediately in order to prevent a similar epidemic from arising whenever conditions of unusual crowding occur. The engineering and inspection laws relative to big buildings should be revised if necessary and immediately enforced not only in Chicago but in all cities in which such conditions might possibly arise.

Current Comment

RADIO HEALTH DRAMAS RESUMED

Beginning October 13, the American Medical Association and the National Broadcasting Company resume the health dramatizations broadcast during 1935-1936 under the title Your Health. The first program will be broadcast October 13 and will be the thirty-second nation-wide dramatized program broadcast by the American Medical Association. Details as to the time of day, the stations to which the program will be available, and the topics will be found under Association News in this issue of THE JOURNAL. These dramatized radio programs have been described in the *American Medical Association Bulletin*.[1] The dramatic technic has met with the approval of the profession and of the public. Mail from our audiences did not cease with the termination of the first series of dramatized broadcasts in May. Throughout the summer letters have continued to come referring to programs given several months prior to the date of the letter and requesting information supplementing the broadcast. This evidence that the dramatized technic not only interests at the time but makes a lasting impression justifies continuance of this more expensive and more difficult technic in preference to the didactic talk. The presentation of dramatized radio programs in cooperation with the National Broadcasting Company is an instance of how the radio networks are prepared to cooperate in educational broadcasting. Physicians do not always see eye to eye with the radio in matters of advertising and with relation to restrictions on discussion of some medical topics. The cooperation of the radio in educational programs of this kind is an evidence of willingness to grant expensive radio time and network facilities in the public interest. It should lead to a better mutual understanding between the medical profession and the radio industry, which will be helpful in the solution of their mutual problems. Putting a radio program on the air is only the first step. The radio as an advertising medium is valuable, but it does not stand alone. Neither does it stand alone as an educational medium. The radio must be supplemented with other forms of publicity. The program Your Health will be delivered to the Red network and the Pacific network of the National Broadcasting Company and will be available to approximately sixty stations. These stations may take it or leave it. The local decision may often be influenced by evidence of a local demand. The local medical societies have an opportunity to aid in popularizing the program by calling attention of their patients to it, both individually and collectively, through newspaper announcements and other means that may suggest themselves

1. Bauer, W. W.: Dramatizing the Health Message, A. M. A. Bull. **30**: 97 (Oct.) 1935; Evaluating Health Dramatizations, ibid. **31**: 114 (May) 1936.

in the local situation. An attractive announcement card which may be hung in the office of the physician is in preparation and will be sent gratis on receipt of a postcard or letter addressed to the Bureau of Health and Public Instruction, American Medical Association, 535 North Dearborn Street, Chicago. The greatest measure of success for this educational project can be achieved only through the highest degree of cooperation between the American Medical Association and local medical societies and auxiliaries.

Association News

RADIO BROADCASTS

Health Dramas to be Resumed October 13

The American Medical Association and the National Broadcasting Company present the second series of dramatized health broadcasts under the title Your Health, beginning October 13. The first broadcast in the new series will be the thirty-second dramatized cooperative broadcast under the title Your Health. The theme for 1936-1937 will differ slightly from the topic in the first series, which was "medical emergencies and how they are met." The new series will be built around the central idea that "100,000 American physicians in great cities and tiny villages, who are members of the American Medical Association and of county and state medical societies, stand ready, day and night, to serve the American people in sickness and in health."

The program will be on the Red network and Pacific network of the National Broadcasting Company. The following stations are those to which the program is available:

New England States

WEEI—Boston
WTIC—Hartford
WJAR—Providence
WTAG—Worcester
WCSH—Portland, Me.

Middle Atlantic States

WEAF—New York
KYW—Philadelphia
WCAE—Pittsburgh
WGY—Schenectady
WBEN—Buffalo

West North Central States

KSD—St. Louis
WHO—Des Moines
WOW—Omaha
WDAF—Kansas City
KSTP—Minneapolis-St. Paul
WEBC—Duluth-Superior
WDAY—Fargo
KFYR—Bismarck

East North Central States

WTAM—Cleveland
WLW—Cincinnati
WSAI—Cincinnati
WCKY—Cincinnati
WWJ—Detroit
WMAQ—Chicago
WTMJ—Milwaukee
WIBA—Madison
WHIO—Dayton
WIRE—Indianapolis
WOOD—Grand Rapids

West South Central States

WSMB—New Orleans
KVOO—Tulsa
WKY—Oklahoma City
WFAA—Dallas, Fort Worth
WBAP—Dallas, Fort Worth
KTHS—Hot Springs
KTBS—Shreveport
KPRC—Houston
WOAI—San Antonio

South Atlantic States

WFBR—Baltimore
WRC—Washington
WRVA—Richmond
WTAR—Norfolk
WFBC—Greenville, S. C.
WCSC—Charleston, S. C.
WSOC—Charlotte
WPTF—Raleigh
WWNC—Asheville
WIS—Columbia
WJAX—Jacksonville
WFLA—Tampa
WSUN—Tampa
WIOD—Miami
WSB—Atlanta

East South Central States

WAVE—Louisville
WSM—Nashville
WMC—Memphis
WAPI—Birmingham
WJDX—Jackson

Mountain States

KTAR—Phoenix
KGIR—Butte
KGHL—Billings
KOA—Denver
KDYL—Salt Lake City

Pacific States

KPO—San Francisco
KFI—Los Angeles
KGW—Portland, Ore.
KOMO—Seattle
KHQ—Spokane

Canada

CRCT—Toronto
CFCF—Montreal

Hawaii

KGU—Honolulu

It should be noted that a station may take the program or not. If a station included in the list is not broadcasting the program Your Health, it is possible that the management may be induced to broadcast the program if it receives evidences of local interest. The committee on education or other appropriate committee of the local medical society might take this matter up with the station management and tender cooperation in giving the program local publicity.

The topics are announced monthly in advance in *Hygeia*, the Health Magazine, and three weeks in advance in each weekly issue of THE JOURNAL. The topics and speakers for October are as follows:

October 13. What to Do for Blind Children. W. W. Bauer, M.D.
October 20. Arthritis. Morris Fishbein, M.D.
October 27. Help for the Deafened. W. W. Bauer, M.D.

The time of the broadcast is Tuesday afternoon at 5 o'clock eastern standard time (4 o'clock central time, 3 o'clock mountain time, 2 o'clock Pacific time).

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

The Prevalence of Poliomyelitis.—A total of 335 cases of poliomyelitis with twenty-five deaths has been reported in Alabama between January 1 and September 11, according to the state department of health. The incidence has been heaviest in Jefferson County with seventy-one cases. Next in order are Lauderdale with forty-seven cases; Morgan with thirty-eight; Colbert, twenty-eight; Franklin, twenty; Cullman, eighteen; Limestone, sixteen; Lawrence, twelve; Madison, eleven; Blount, eight, and Marengo and Marshall, five each. Scattered cases of one or two each appear in other counties. In twenty of the sixty-seven counties of the state no cases of the disease have been reported; they are Chambers, Lee, Macon, Russell, Barbour, Henry, Houston, Coffee, Covington, Crenshaw, Butler, Wilcox, Monroe, Conecuh, Washington, Clarke, Choctaw, Sumter, Greene and Perry. The opening of rural schools was postponed in northern Alabama, eastern Mississippi and southwest Georgia, the New York *Times* reported September 4, with the tentative date of opening set at September 21. The *Times* also reported, September 10, that during the preceding week 183 cases were recorded throughout the country, Illinois leading with thirty cases and California being second with twenty-five. There were twenty cases in New York.

ARIZONA

Memorial to Dr. Harlow Brooks.—The first "Harlow Brooks Memorial Navajo Clinical Conference" was held at Sage Memorial Hospital, Ganado, August 31-September 1. The speakers included Drs. Fred H. Albee, New York; Milo K. Tedstrom, Santa Ana, Calif.; William W. Peter, Fort Defiance, medical director of the Navajo service; Joseph Madison Greer, Phoenix; Albert G. Jenner, Milwaukee; Edwin Forrest Boyd, Los Angeles, and Clarence E. Yount, Prescott; moving pictures made by Dr. Joseph B. De Lee, Chicago, Edgar A. Doll, Ph.D., Vineland, N. J., and Dr. Julius S. Weingart, Des Moines, Iowa, were also shown. The conference, to be held annually, is named in honor of the late Dr. Harlow Brooks, New York, who was interested in the work of the Sage Memorial Hospital. Ganado is in the heart of the Navajo reservation.

CALIFORNIA

Personal.—Dr. Joseph Pomeroy Widney, member of the class of 1866 of Toland Medical College (now the University of California Medical School), San Francisco, is the subject of a biography now being distributed throughout the state. Dr. Widney, now 95 years of age, was one of the founders and early presidents and first dean of the University of Southern California. The biography was first published in *California and Western Medicine*.

Society News.—The San Francisco County Medical Society was addressed, September 15, by Chauncey D. Leake, Ph.D., on "Recent Advances in Industrial Toxicology" and Floyd DeEds, Ph.D., U. S. Department of Agriculture, on "Toxicity of Spray Residues." This was a joint meeting with the section

on industrial medicine. —— At a recent meeting of the San Bernardino County Medical Society the Friedman test in the abnormal states of pregnancy and in early chorionepithelioma were discussed by Drs. George D. Maner and Edmond M. Lazard, both of Los Angeles. —— The Los Angeles Cancer Society was addressed, September 3, by Dr. Edwin I. Bartlett, San Francisco, on "Cancer of the Breast, with a Five Year Follow-Up of Over 100 Cases and a Discussion on Treatment with Ultimate Results."

CONNECTICUT

New State Epidemiologist.—Dr. Paul H. Brown, for six years health officer of East Haven, has been appointed epidemiologist to the state department of health, newspapers report. He will be succeeded by Dr. Robert M. Taylor, now coroner's physician. The change was effective September 1.

Summering Physicians Barred from Practice.—Physicians licensed and residing in other states but maintaining summer homes in Connecticut cannot care for patients in Connecticut, according to an opinion filed August 3 with the state department of health by Attorney General Edward J. 'Daly. In his opinion, the attorney general said, according to newspaper reports: "Under the provisions of Section 1121C, cumulative supplement, general statutes of 1935, no such physician can obtain a certificate of registration to practice medicine and surgery in the state, inasmuch as he can not be said to permanently reside in this state."

GEORGIA

Dr. Hoke Resigns at Warm Springs.—Dr. Michael Hoke, since 1931 surgeon-in-chief of the Georgia Warm Springs Foundation, Warm Springs, has resigned to engage in practice in Atlanta. Dr. Hoke graduated from the University of Virginia Department of Medicine, Charlottesville, in 1895. Dr. Charles E. Irwin, assistant to Dr. Hoke, has been named surgeon-in-chief. He is 36 years old and a graduate of Emory University College of Medicine, Atlanta.

Dr. Fischer Honored.—Dr. Luther C. Fischer, Atlanta, was honored at a birthday dinner given by the staff of the Crawford W. Long Memorial Hospital, of which he is president and treasurer. A sterling silver vase was presented to him. Speakers included Drs. Odom O. Fanning, who made the presentation speech, Walter B. Emery and Rufus T. Dorsey. Dr. Fischer in 1925 established the L. C. Fischer prizes to be awarded through the Fulton County Medical Society; two prizes of $100 each have been available every year since that time.

ILLINOIS

Personal.—Dr. Hal E. Freeman, Willard, Mo., has been appointed a member of the student health service, University of Illinois, Urbana.——Dr. Philip McGinnis has been appointed health officer of Joliet township, succeeding Dr. Londus Brannon, who resigned after three years' service.

Clinical Conference.—Physicians of western Illinois will be guests of the McDonough County Medical Society at a clinical conference in Macomb, September 24. Dr. Robert S. Berghoff, Chicago, will conduct a heart clinic in the afternoon, and ten patients will be presented by local physicians for examination and demonstration. In addition, Dr. Berghoff will speak on common diseases of the heart; Dr. Joseph E. F. Laibe, Chicago, on hematuria, and Dr. William J. Pickett, Chicago, thyroid surgery.

Meeting of Bacteriologists.—The Society of Illinois Bacteriologists will meet at the Urbana-Lincoln Hotel, Urbana, September 26. Speakers will include:

Ralph E. Noble, B.S., Chicago, Status of Bacteriologic Water Analysis.
C. A. Brandly, Urbana, Observations on Egg Propagation of Filtrable Viruses.
Martin J. Prucha, Ph.D., Urbana, Sterilization, Disinfection, "Bactericidalation" and "Bacteriostatication."
Arthur M. Buswell, Ph.D., Urbana, Anaerobic Fermentations Yielding Combustible Gases.
Dr. Ernst A. Pribram, Chicago, A Report on the Second International Congress for Microbiology, London, England, 1936.

Society News.—The McLean County Medical Society was addressed, September 10, by Drs. Gladys R. H. Dick, Evanston, on scarlet fever; Rosco G. Leland, director, Bureau of Medical Economics, American Medical Association, economics and the ethics of medicine, and William H. Holmes, Chicago, clinical aspects of nephritis.——Dr. Franklin E. Walton, St. Louis, spoke before the Vermilion County Medical Society, September 1, on "Diagnosis and Management of Biliary Tract Diseases."——At a meeting of the St. Clair County Medical Society in Belleville, September 2, Dr. Vincil Rogers Deakin, St. Louis, spoke on "Pyelitis of Pregnancy." Dr. Frank G. Norbury, Jacksonville, addressed the East St. Louis meeting, September 3, on "Neuropsychiatry in General Practice."—— Dr. William B. Serbin, Chicago, addressed the Coles-Cumberland County Medical Society, September 10, on "Toxemias of Pregnancy."

Chicago

Dr. Braasch Will Give Belfield Lecture.—Dr. William F. Braasch, professor of urology, University of Minnesota Graduate School of Medicine, Minneapolis-Rochester, will deliver the eighth annual William T. Belfield Lecture of the Chicago Urological Society, October 29. His subject will be "Unilateral Chronic Pyelonephritis."

Lectures on Cancer.—The cancer research committee of the Chicago Woman's Club announces its annual lectures on cancer, with the following speakers:

Dr. Max Cutler, October 22, Cause and Cure of Cancer.
Dr. Harold E. Robertson, October 29, Rochester, Minn., Scientific Aspects of Cancer.
Dr. Frank L. Rector, Evanston, November 5, Cancer, A Public Health Problem.
Miss Edna Foley, superintendent, Visiting Nurse Association, Nursing Care of Cancer Patients in Chicago.
Dr. William W. Bauer, director, Bureau of Health and Public Instruction, American Medical Association, November 12, Importance of Popular Education on Cancer and Approved Methods of Carrying on Such Education.

INDIANA

Personal.—Dr. Robert A. Staff, for three years a member of the staff of the Indiana State Sanatorium, Rockville, has been appointed medical superintendent of the Smith Esteb Memorial Hospital, Richmond, succeeding Dr. Joseph W. Strayer, who resigned to accept a similar position at the William Ross Sanatorium, Lafayette.

New Clinical Building at University.—Contracts have been awarded for a new clinical building at the Indiana University School of Medicine, Indianapolis, and construction is expected to begin soon, according to the state medical journal. The total cost of the building will be about $550,000, of which the federal government will pay 45 per cent as a PWA project; the remainder will be paid by the university through a bond issue. The building, five stories high, will be situated immediately north of the Robert W. Long Hospital.

IOWA

Graduate Courses.—The Iowa State Medical Society will offer graduate courses in Davenport, Waverly, Sheldon, Oskaloosa and Chariton this fall. The first course, devoted to cancer, opened in Waverly, September 17, and is sponsored by the First, Second and Sixth Councilor Districts, but physicians from other districts are invited to attend; it will be given on Thursdays. The course in general therapeutics and diagnosis given at Davenport will be conducted on Tuesdays; the opening lecture was September 15. Meetings at Sheldon will be held on Mondays, beginning September 21 and continuing through November 9. The course on cancer will be presented by the following:

Dr. Richard H. Jaffé, Chicago, Morbid Anatomy and Physiology of Malignant Tumors.
Dr. Elexious T. Bell, Minneapolis, Present Status of Cancer Knowledge.
Dr. Loyal Davis, Chicago, Malignant Neoplasms of the Nervous System.
Dr. Gordon B. New, Rochester, Minn., Malignant Tumors of the Head.
Dr. Arthur U. Desjardins, Rochester, Evaluation of Radiologic Diagnosis and Treatment.
Dr. Owen H. Wangensteen, Minneapolis, Cancer of the Esophagus, Stomach and Small Intestine.
Dr. Erwin R. Schmidt, Madison, Wis., Sarcomas.
Dr. Ruben Nomland, Iowa City, Cancer of the Skin.
Dr. Claude F. Dixon, Rochester, Cancer of the Colon and Rectum.

Therapeutics and diagnosis will be treated by the following speakers:

Dr. Samuel A. Levine, Boston (tentative), Modern Cardiac Therapy.
Dr. William S. Middleton, Madison, Wis., The Barbiturates in the Treatment of Disease.
Dr. Howard L. Beye, Iowa City, Principles Involved in the Treatment of Fractures.
Dr. Rollin T. Woodyatt, Chicago, Diet in the Treatment of Disease.
Dr. John S. Lundy, Rochester, Evaluation of Intravenous Therapy.
Dr. Paul A. O'Leary, Rochester, Treatment of Syphilis.
Dr. Philip S. Hench, Rochester, Diagnosis and Treatment of Arthritis.
Dr. Percival Bailey, Chicago, Diagnosis and Treatment of Common Neurologic Lesions Found in General Practice.
Dr. Warren T. Vaughan, Richmond, Va., Evaluation of the Present Knowledge of Allergy.
Edward A. Doisy, Ph.D., St. Louis (tentative), Present Status of Endocrine Therapy.
Dr. Henry W. Meyerding, Rochester, Fractures.
Dr. Maurice C. Howard, Omaha, Diagnosis and Treatment of the Anemias.
Dr. John A. Borghoff, Omaha, Diagnosis and Treatment of Common Skin Disorders.
Dr. Byrl R. Kirklin, Rochester, Roentgenologic Diagnosis.
Dr. Norman M. Keith, Rochester, Use and Abuse of Diuretics.
Dr. Oscar H. Plant, Iowa City, Recent Advances in Therapeutics.
Dr. Russell M. Wilder, Rochester, Modern Treatment of Diabetes.
Dr. Everett D. Plass, Iowa City, The Ovarian Hormones in Obstetrics and Gynecology.

KANSAS

Health at Kansas City.—Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million, for the week ended September 5, indicate that the highest mortality rate (18.4) appears for Kansas City and for the group of cities as a whole, 9.6. The mortality rate for Kansas City for the corresponding period last year was 11.1 and for the group of cities, 9.4. The annual rate for eighty-six cities for the thirty-six weeks of 1936 was 12.4 as against a rate of 11.6 for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

KENTUCKY

State Medical Meeting at Paducah, October 5-8.—The annual meeting of the Kentucky State Medical Association will be held in Paducah, October 5-8, with headquarters at the Irvin Cobb Hotel. The speakers will include:

Dr. Emmet F. Horine, Louisville, An Evaluation of Heart Sound Records from a Clinical Standpoint.
Dr. Finis M. Travis, Frankfort, Treatment of the Different Types of Edema.
Dr. Henry W. Cave, New York, Recent Trends in the Surgical Management of Biliary Tract Disease.
Dr. Irvin Abell, Louisville, Relation of Surgery to Diabetes.
Dr. Carlisle R. Petty, Lynch, Management of an Epidemic of Cerebrospinal Meningitis in an Industrial Community.
Dr. Oscar O. Miller, Louisville, Pulmonary Abscess and Its Treatment.
Dr. William Barnett Owen, Louisville, Consideration of Complicated Fractures of the Femur.
Dr. Francis M. Sherman, Owensboro, Interpretation of Gastric Pain.

Dr. John H. J. Upham, Columbus, Ohio, President-Elect of the American Medical Association, will be the speaker at a public meeting Tuesday evening, October 6. The annual oration in surgery will be delivered by Dr. DeLou P. Hall, Louisville, on "Joshua B. Flint, First Professor of Surgery, University of Louisville, 1837" and the oration in medicine by Dr. John Harvey, Lexington, on "Our Duty to the Art and Science of Medicine." There will be round table discussions Tuesday and Wednesday afternoons on surgery, obstetrics, pediatrics, general medicine, otolaryngology, ophthalmology and psychiatry. A symposium on obstetrics and pediatrics will be presented by Drs. Russell E. Kinsey, Williamstown; Joseph T. Molony, Covington; Orion Leon Higdon, Paducah; Richard G. Elliott II, Lexington, and Harry S. Andrews, Louisville. At the annual dinner Wednesday evening Drs. James E. Paullin, Atlanta, Ga., and Albert M. Mitchell, Terre Haute, Ind., will be the guest speakers.

MARYLAND

Illness from Custard Pastries.—During the latter part of August twelve persons in Baltimore were ill from eating custard-filled doughnuts. Prompt reporting of the outbreak and immediate investigation by the city health department prevented other cases developing. The custard used was made at about 2 a. m. and allowed to cool in the baking room for about three hours without refrigeration. The doughnuts were then filled with it and offered for sale at about 9 o'clock. Each of the persons made ill by the custard ate from one to three of the pastries bought at about that time and before 11 o'clock each victim was seized with intense pain in the abdomen, vomiting and prostration. The time of onset and the symptoms were almost identical in all the patients, none of whom gave a history of having eaten any additional food or of drinking any beverage, *Baltimore Health News* reported.

MASSACHUSETTS

New Chairman of Medical Board.—Dr. Francis R. Mahony, Lowell, for many years a member of the Massachusetts Board of Registration in Medicine, was elected chairman of the board at a meeting, August 28. He succeeds Dr. Charles P. Sylvester, who resigned on account of ill health.

Society News.—The Pentucket Association of Physicians was addressed September 10 by Dr. Donald Munro, Boston, on "Responsibility of the General Practitioner in Relation to Common Neurosurgical Conditions"; Dr. Arthur W. Allen, Boston, will discuss "Diseases of the Peripheral Vascular System" before the society, October 8.——Drs. Richard H. Miller and Cadis Phipps, Boston, will address the Worcester District Medical Society in Milford, September 23, on peptic ulcer.

Sir Frederick Hopkins to Give Dunham Lectures.—Sir Frederick Gowland Hopkins, professor of biochemistry, University of Cambridge, will lecture at the Harvard Medical School, Boston, on "The Significance of Catalysis in Biology." The lectures, under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, will be presented October 6 on "The Catalytic Equipment of Micro-Organisms," and October 8 on "The Nature of Biocatalytic Systems in General."

MICHIGAN

Personal.—George F. Forster, Ph.D., professor of biology at Olivet College, Olivet, has been appointed bacteriologist to the state department of health. He will be on leave of absence from the college for a year.——Dr. Edward J. Witt, St. Joseph, was made an emeritus member of the Cass and Berrien county medical societies at a meeting, August 19; Dr. Witt is retiring from active practice and plans to leave the city.

New Laboratory Building.—A new laboratory building for the state department of health is under construction four miles north of Lansing. A WPA project, the original appropriation for the building was $111,518, but an additional 10 per cent has been allowed by the government to make up for increases in labor costs. All departments of laboratory work will be carried on in the new structure. C. C. Young, Ph.D., Lansing, is in charge of the state department laboratory.

State Medical Meeting at Detroit, September 21-24.—The seventy-first annual meeting of the Michigan State Medical Society will be held at the Book-Cadillac Hotel, Detroit, September 21-24, under the presidency of Dr. Grover C. Penberthy. The guest speakers will include:

Dr. Charles Gordon Heyd, New York, Vice President, American Medical Association, Society and Organized Medicine.
Dr. Dean Lewis, Baltimore, Hormones in Relation to Tumor Growth.
Dr. Cecil S. O'Brien, Iowa City, Ocular Symptoms and Signs of Brain Tumor.
Dr. Isidore Friesner, New York, Otology (round table).
Dr. Fred Wise, New York, Skin Diseases in Their Relation to Disturbances of Other Organs.
Dr. George Herrmann, Galveston, Texas, Further Studies of the Mechanism of Action and of the Relative Effectiveness of the Newer Diuretics.
Dr. Emil Novak, Baltimore, Pseudomalignant and Precancerous Lesions of the Uterus.
Dr. Richard Cannon Eley, Boston, The Control of Measles.
Dr. Albert L. Brown, Cincinnati, Treatment of Ocular Inflammations with Increased Intra-Ocular Typhoid Antibody Concentration.
Dr. Byrl R. Kirklin, Rochester, Minn., Differential Diagnosis of Benign from Malignant Ulcerative Lesions of the Stomach.

There will be symposiums on certain complications of pregnancy, carcinoma of the lung and fractures. Dr. Lewis will conduct a special demonstration in traumatic surgery. President's Night will be observed Wednesday evening, September 23, when Dr. Penberthy will deliver his presidential address and Dr. Henry E. Perry, Newberry, will be inducted into the presidency. The Andrew P. Biddle Oration will be delivered on this occasion by Dr. George W. Crile, Cleveland; his subject will be "Comparative Anatomy and Pathologic Physiology of the Adrenal-Sympathetic Complex Relating to the Genesis and Surgical Treatment of Essential Hypertension."

MINNESOTA

Personal.—Dr. Hobart A. Reimann, Minneapolis, associate professor of medicine, University of Minnesota Medical School, was guest of honor at a farewell dinner, August 20; Dr. Reimann has been named Magee professor of medicine at Jefferson Medical College, Philadelphia.

MISSOURI

Society News.—At a meeting of the South Central Counties Medical Society in Houston, August 6, speakers were Drs. Duff S. Allen and Carliss Malone Stroud, St. Louis, on differential diagnosis of acute abdominal conditions and allergy respectively; Dr. Allen also discussed goiter.——The Cass County Medical Society was addressed, June 11, among others, by Dr. Lotis V. Murray, Pleasant Hill, on "Chronic Endocervicitis."

NEVADA

State Medical Meeting.—The thirty-third annual meeting of the Nevada State Medical Association will be held in Reno, September 25-26, with headquarters at the Golden Hotel and under the presidency of Dr. Richard O. Schofield, Boulder City. Speakers on the program will be:

Dr. Harold M. F. Behneman, San Francisco, Modern Concepts in Therapy of Cardiac Diseases.
Dr. Eugene S. Kilgore, San Francisco, Some of the Surgeons' Circulatory Problems.
Dr. Charles F. McCuskey, Los Angeles, Anesthetic Agents and Methods.
Dr. Albert R. Da Costa, Reno, Problems in Anesthesia.
Dr. George Warren Pierce, San Francisco, Treatment of Burns and Reconstruction Surgery After Burns.
Dr. Horace C. Pitkin, San Francisco, Low Back Pain.
Dr. William W. Washburn, San Francisco, When Should Peptic Ulcer Be Treated Surgically?
Dr. John W. Cline, San Francisco, Surgery of the Colon.

NEW JERSEY

Typhoid at Englewood.—Two persons have died among thirty-six stricken with typhoid at Englewood in an outbreak attributed to drinking water from a spring. A guard was posted at the spring after the second death occurred September 5.

NEW YORK

Automobile Toll Reduced.—The number of motor vehicle accidents and the number of persons killed and injured were reduced in the first six months of 1936, as compared with the corresponding period of 1935, the Bureau of Motor Vehicles recently reported. The number of accidents was 34,159, compared with 35,503; the number of persons killed 1,047 compared with 1,199, and the number injured 42,867 compared with 44,609. Of the accidents, 16,159 were collisions with pedestrians; 13,031, collisions with other cars. Of 47,418 motorists involved, 295 were listed as intoxicated and 32 as having a physical defect. Of 16,640 pedestrians involved, 470 were said to have been intoxicated, 97 had physical defects and 819 were confused by traffic.

New York City

Drs. Park and Senior Retire from University.—Dr. William Hallock Park, Hermann M. Biggs professor of preventive medicine, and Dr. Harold Dickinson Senior, professor of anatomy at New York University College of Medicine, retired from the faculty September 1 as professors emeritus. Dr. Park, now 73 years old, has been associated with the university since 1898, when he was appointed adjunct professor of bacteriology and hygiene. A year later he was promoted to the rank of associate professor and in 1900 professor, a chair he held until 1933, when he was designated the first incumbent of the Biggs chair of preventive medicine. He will not officially terminate his teaching service until the end of next year, when he will complete a year's leave of absence. Dr. Senior is a native of England, a graduate of the University of Durham. After several years of teaching in England he spent several years in Canada and later served on the faculties of the Medico-Chirurgical College of Philadelphia and Syracuse University and spent three years as a fellow in the Wistar Institute of Anatomy and Biology, Philadelphia. In 1910 he was appointed professor of anatomy and director of the anatomic laboratories of New York University. He has been for many years an associate editor of the *American Journal of Anatomy* and has held office in the American Association of Anatomists. During the World War Dr. Senior was on leave of absence from the university to engage in hospital service near his alma mater, which in 1918 conferred on him an honorary degree and a gold medal.

NORTH DAKOTA

Personal.—The governor has recently reappointed Drs. George M. Williamson, Grand Forks, Albert W. Skelsey, Fargo, and Archibald D. McCannel, Minot, to the North Dakota State Board of Medical Examiners.

OHIO

State Medical Meeting at Cleveland.—The ninetieth annual meeting of the Ohio State Medical Association will be held in Cleveland October 7-9 at the Public Auditorium. Hotel headquarters will be at the Hotel Cleveland. Guest speakers who will address general and section meetings are:

Dr. Andrew C. Ivy, Chicago, Therapy of Biliary Tract Disease from the Viewpoint of Applied Physiology.
Dr. Walter E. Dandy, Baltimore, Diagnosis and Treatment of Brain Tumors.
Dr. George M. Lyon, Huntington, W. Va., Medical Participation in a School Health Program.
W. H. Drane Lester, Federal Bureau of Investigation, Washington, D. C., Modern Scientific Crime Detection and the Medical Profession.
Dr. John R. Caulk, St. Louis, Management of Obstructions at the Bladder Neck in Men, Women and Children.
Dr. George W. MacKenzie, Philadelphia, Neurolabyrinthitis.
Drs. Carey P. McCord, Joseph A. Kasper and William L. Brosius, Detroit, A Biologic Test for the Determination of the Fibrogenetic Properties of Dust.

The past presidents' dinner will be Wednesday evening October 7 and the annual banquet Thursday evening at the Cleveland. Sigmund Spaeth, writer and radio speaker on music, will be the speaker at the banquet. The golf tournament will be at the Oakwood Country Club and there will also be trap and skeet shooting events. Dr. Ralph R. Hendershott, Tiffin, is president of the association and Dr. Edwin M. Huston, Dayton, the president-elect.

Typhoid at State Hospital.—Ten cases of typhoid with one death were reported from the Columbus State Hospital, Columbus, September 8. Inoculation of 2,900 patients and 300 employees was begun immediately. The source of the infection had not been determined at the time of the report.

Society Fifty Years Old.—The Adams County Medical Society celebrated the fiftieth anniversary of its founding at a meeting in Seaman, August 19. Speakers were Drs. Robert Carothers, Cincinnati; John N. Ellison, Portsmouth, and Oliver T. Sproull, West Union. Dr. Sproull was a charter member of the society.

Graduate Lectures at Lima.—The Lima and Allen County Academy of Medicine will present its eighth annual graduate course September 21-25. Dr. Samuel A. Levine, assistant professor of medicine, Harvard University Medical School, Boston, will be the lecturer on diseases of the heart and allied pathologic conditions.

PENNSYLVANIA

Society News.—Dr. Everett N. Collins, Cleveland, addressed the Washington County Medical Society, Washington, September 9, on "Diseases of the Colon."——Dr. Harold W. Jones, Philadelphia, addressed the Lycoming County Medical Society, Williamsport, September 11, on "Treatment of Hypertension, with Special Reference to Headache and Blood Diseases."——Drs. Dean D. Lewis and John T. King, Baltimore, conducted a surgical and medical clinic at the Conemaugh Valley Memorial Hospital as guests of the Cambria County Medical Society, Johnstown, September 10. They addressed the society in the evening at a dinner at the Sunnehanna Country Club.

Medical Activities in Johnstown's Second Flood.—The Cambria County Medical Society published in its September bulletin a report of its medical activities following Johnstown's disastrous flood, March 17. The society in cooperation with Dr. James J. O'Connor, Barnesboro, county medical director acting for the state department of health, set up medical headquarters in a high school, the functions of which were to receive and distribute medical supplies to flood sufferers and to physicians, fifty-nine of whom had their equipment, drugs or homes flooded; to provide medical care for the injured and sick; to receive and deliver messages from patient to physician (for two days the only communication was by messenger); to issue bulletins on health measures and the health situation of the community, and to provide means of meeting the problems of health and sanitation as they arose. Twenty-one refugee centers were established, with physicians and nurses in charge. State sanitary engineers supervised the water supply, members of the state milk control board the milk supply, using a mobile laboratory attached to the medical center. Medical supplies were furnished mainly by the state department of health, but many donations were received from adjacent towns and private sources. Physicians of the society at the hospitals and the refugee centers gave medical attention to 13,211 persons, of whom 1,587 were immunized against typhoid. A vast majority of those who required medical care were suffering from infection of the upper respiratory tract. There were only eleven cases of contagious disease in the refugee centers and these were contracted before the flood. The medical center was demobilized thirty-one days after the flood. Members of the flood committee of the society were Drs. William Frederick Mayer, Leo W. Hornick, Benjamin A. Braude, Horace B. Anderson, Louis H. Mayer Jr., Johnstown, and James J. O'Connor, Barnesboro.

UTAH

Plague Infection.—A ground squirrel, Citellus grammurus, found in Indian Creek Canyon, 11 miles northeast of Beaver, Beaver County, was reported under date of August 7 to be plague infected, according to *Public Health Reports.*

WISCONSIN

Personal.—Dr. Eilef A. Smedal, La Crosse, has been appointed to the governor's committee on public welfare as a member of the subcommittee on health and disability.

Graduate Course on Syphilis.—The committee on postgraduate instruction of the Medical Society of Milwaukee County has arranged a course of lectures on syphilis to be given at Marquette University School of Medicine, Milwaukee. The lecturers and their subjects are:

Dr. Charles C. Dennie, Kansas City, Mo., September 28, General Aspects of Syphilis.
Dr. Roy W. Scott, Cleveland, October 12, Cardiovascular Syphilis.
Dr. Udo J. Wile, Ann Arbor, Mich., October 19, Bone, Joint and Visceral Syphilis.
Dr. Roland P. Mackay, Chicago, October 26, Neurosyphilis.
Dr. James E. Paullin, Atlanta, Ga., November 2, Public Health Aspects of Syphilis.
Dr. Paul A. O'Leary, Rochester, Minn., November 9, Treatment of Syphilis.

WYOMING

State Medical Election.—Dr. John R. A. Whitlock, Powell, was chosen president-elect of the Wyoming State Medical Society at its annual meeting in August. Dr. Josef F. Replogle, Lander, was installed as president and Dr. Marshall C. Keith, Casper, was elected secretary, succeeding Dr. Edwin Earl Whedon, Sheridan. Next year's meeting will be held as a part of the Rocky Mountain joint medical meeting in Denver.

CANAL ZONE

Colonel Pillsbury Named Health Officer.—Col. Henry C. Pillsbury, medical corps, U. S. Army, reported to Gov. Clarence S. Ridley, Balboa, September 2, for assignment to duty as chief health officer of the Panama Canal Zone. He will be in charge of sanitation, quarantine and hospital services, the New York *Times* reported.

GENERAL

Meeting Dates Changed.—The American Clinical and Climatological Association will hold its annual meeting in Richmond, Va., October 26-28, instead of October 19-21 as was previously announced. Dr. Francis M. Rackemann, 263 Beacon Street, Boston, is secretary.

Pan-Pacific Association Election.—Dr. J. Hardie Neil, Auckland, New Zealand, was elected president of the Pan-Pacific Surgical Association at its second congress in Honolulu, August 6-14. Dr. Edgar L. Gilcreest, San Francisco, was made first vice president; Dr. James R. Judd, Honolulu, second vice president, and Dr. Forrest J. Pinkerton, Honolulu, secretary. The congress was attended by 188 delegates.

Impostor Impersonates Physician.—Dr. Robert B. McGraw, New York, reports that a man giving the name Mr. Robert McGraw about August 13 opened an account with a branch of the Chase National Bank with a check on a bank in Springfield, Mass. He later cashed checks at the Hotel Monterey, Asbury Park, N. J. Subsequently he appears to have traveled through southern New England and New York State. Lately he has been using Dr. McGraw's home address, 1215 Madison Avenue, New York. He is described as about 5 feet 11 inches tall, weighing about 200 pounds.

Hospital Meeting.—The American Hospital Association will hold its annual meeting in Cleveland, September 28-October 2. Speakers will include:

Dr. Edward William Alton Ochsner, New Orleans, Group Hospitalization from the Standpoint of the Medical Profession.
Dr. George W. Crile, Cleveland, Relations of Administration to Medical Progress in Hospitals.
Dr. Joseph C. Doane, Philadelphia, Hospital Intangibles.
Dr. Borden S. Veeder, St. Louis, Relation of the Hospital Residency to Graduate Education in Pediatrics.

The annual banquet and ball will be held at the Hotel Statler Wednesday evening.

Roentgen Ray Meeting.—The thirty-seventh annual meeting of the American Roentgen Ray Society will be held at the Hotel Cleveland, Cleveland, September 29-October 2. Speakers will include:

Drs. Elliott C. Cutler and Max T. C. Schnitker, Boston, Clinical Aspects of Adenomas of the Pituitary Body.
Drs. Charles H. Frazier, Bernard J. Alpers, Eugene P. Pendergrass and George W. Chamberlin, Philadelphia, Effect of Irradiation on Gliomas of the Brain.
Drs. Warfield T. Longcope and John W. Pierson, Baltimore, The Generalized Form of "Boeck's Sarcoid."
Gioacchino Failla, D.Sc., Memorial Hospital, New York, Biophysical Considerations Relating to the Radiological Treatment of Cancer of the Larynx.
Dr. Edward William Alton Ochsner, New Orleans, The Physiologic Consideration of Ileus.
Dr. Charles F. Geschickter, Baltimore, Endocrines and Irradiation in Experimental Hypertrophy of the Prostate.
Drs. Robert B. Taft and Hillyer Rudisill Jr., Charleston, S. C., Determination of Gamma-Ray Activity of Thorium Dioxide Sol in Liver Patients.

Society News.—The fifteenth annual Congress of Anesthetists will be held in Philadelphia October 19-23, with headquarters at the Hotel Adelphia. The congress includes the Associated Anesthetists of the United States and Canada, the International Anesthesia Research Society, the Eastern Society of Anesthetists, the Mid-Western Association of Anesthetists and the Southern Association of Anesthetists.——Dr. Frederick L. Wahrer, Marshalltown, Iowa, was chosen president-elect of the American Congress of Physical Therapy at the annual meeting in New York September 9. Dr. William Bierman, New York, was installed as president. Vice presidents elected are Drs. Frank H. Krusen, Rochester, Minn.; Grant E. Ward, Baltimore; William J. Egan, Milwaukee; Nathan H. Polmer, New Orleans, and Fred B. Moor, Loma Linda, Calif. The society's gold key of merit was bestowed on Dr. Edwin Beer, New York; Prof. Joseph Plotnikow of Yugoslavia; Prof. Stefan Jellinek of Austria and Sir Henry Gauvain, London. The 1937 meeting will be in Cincinnati.

Tax-Free Alcohol for Charitable Clinics.—Clinics operated for charitable purposes may obtain alcohol without paying the $2 a gallon federal tax thereon, by virtue of a provision in the Liquor Tax Administration Act, approved June 26, 1936. Application for a permit to procure tax-free alcohol should be filed with the district supervisor of the Alcohol Tax Unit who has jurisdiction in the district in which the permit is to be effective, on forms obtainable from him. Alcohol free from the federal tax may still be procured for the use of any scientific university or college of learning, any laboratory for use exclusively in scientific research, and any hospital or sanatorium. According to amended regulations promulgated by the Commissioner of Internal Revenue, August 21, the tax-free alcohol thus procured, except for use in laboratories, can lawfully be used only for medicinal, mechanical and scientific purposes and, when used by hospitals, sanatoriums and clinics, for the additional purpose of treating patients. In laboratories, the alcohol may be used only in scientific research. Tax-free alcohol may in no case be used in the preparation of food products or for beverage purposes. The use of the alcohol must be confined strictly to the premises of the laboratory, institution or clinic, except that bona fide medicines compounded with tax-free alcohol by a charitable clinic may be used outside the clinic for the treatment of clinic patients. Such medicine, however, may not be sold.

LATIN AMERICA

Orthopedic Society in Argentina.—The Argentine Society of Orthopedic Surgery was founded recently with Drs. Luis A. Tamini, Buenos Aires, as chairman, and Carlos Ottolenghi, Buenos Aires, secretary. Dr. Jose Valls is vice chairman and Dr. Pedro H. Garavano treasurer.

Government Services

First Year of the Social Security Act

A review of the first year of activity under the Social Security Act, ended August 13, set forth that the Social Security Board has approved plans for assistance of the needy aged in thirty-eight states, dependent children in twenty-two, the needy blind in twenty-one and the unemployed in thirteen. It was pointed out that, although the act became law in August 1935, the board had no appropriation until February 11. Under the various forms of assistance the government is aiding more than a million persons with grants of approximately $48,000,000 a year.

Fewer Food and Drug Seizures in June

The U. S. Department of Agriculture reports that only sixteen foods and eight drug items were seized during June. The only enforcement work that maintained the average of previous months was the detection of unfit cream. A total of 1,033 gallons of the unclean and decomposed product was caught en route to creameries and dumped. There was 585 pounds of unclean butter destroyed, and 5,600 pounds of butter below the legal butterfat requirement was seized. Other seizures included 785 containers of so-called olive oil, consisting for the most part of tea seed oil; 1,400 pounds of dried apples containing excessive moisture; 465 cases of apricot juice adulterated with water; 928 cases of short volume tomato juice; 854 bottles of cider vinegar deficient in acidity, of which 264 were also short volume; 144 bottles of short volume olive oil, and 5,250 jars of preserves deficient in fruit; 11,760 cans of dog and cat food; about 84,000 cans of pet food (decomposed); 250 cases of canned asparagus (unsterile and in a state of active decomposition); 3,425 pounds of dried peaches (dirty and insect infested); 2,626 sacks of damaged flour; 776 pounds of polluted crabmeat, and two barrels of olives contaminated with arsenic. Of the eight drug items seized, six were pharmaceuticals: 465 cans of anesthetic ether and twenty-six bottles of chloroform, which had deteriorated; a shipment of tincture of iodine below the legal standard for that drug, and one lot each of nitroglycerin tablets, nicotine-kamala tablets, and carbon tetrachloride compound, each of which failed to meet the standard set up by its own labeling. In addition, two "patent medicines," "Kojene" and "Bowman's Lax-tiv Pills," were seized for false claims.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 5, 1936.

International Congress of Microbiology

At the second International Congress of Microbiology, held in London, more than thirty countries were represented. In his opening address the president, Professor Ledingham, said that the congress was due to the efforts of the Health Section of the League of Nations to reconstitute international scientific meetings, which were interrupted by the World War. They were really a continuation of the congresses of hygiene and demography, the last of which was held at Washington in 1913. But the extraordinary development of bacteriology and microbiology had rendered some subdivision necessary. At the previous congress they worshipped at the shrine of Pasteur. Now they went further back and engraved on their badges Antony van Leeuwenhoek (1632-1723) the Dutch microscopist, who first made a drawing of bacteria.

The congress was divided into eight sections: general biology of micro-organisms; virus diseases in animals and plants; bacteria and fungi; economic bacteriology; medical, veterinary and agricultural zoology and parasitology; serology and immunochemistry; microbiologic chemistry, and specific immunization. The number of papers read reached the extraordinary total of 400.

VIRUSES

The subject of viruses was discussed for two days. Dr. A. R. Dochez and others from New York described researches showing the presence of a filtrable virus in the upper respiratory tract of persons suffering from the common cold and influenza. They had demonstrated the activity of this virus by experimentally producing similar diseases in chimpanzees and in human volunteers. Not the typical picture of influenza but one more resembling the common cold was produced.

Dr. G. H. Eagles brought forward evidence in favor of a virus cause for rheumatoid arthritis and rheumatic fever. Pericardial and pleural exudates from cases of rheumatic fever and joint fluids and synovial membrane from acute and subacute rheumatoid arthritis yielded suspensions of bodies which, in stained preparation and by darkfield examination, were indistinguishable from bodies demonstrable in similar suspensions from recognized virus infections.

CONTROL OF WHOOPING COUGH AND DIPHTHERIA BY SPECIFIC IMMUNIZING REAGENTS

Dr. W. H. Park described an investigation in New York to determine the prophylactic value of pertussis vaccine. Though the incidence of pertussis was low among unvaccinated children, a marked reduction was produced by vaccination with from 65 to 88 million bacilli. Professor Madsen of Denmark said that figures from an isolated community, such as the Faroe Islands, indicated the value of prophylactic vaccination, especially in decreased severity of the disease. Danish clinicians also agreed that a vaccine used in the first two weeks of the disease had a beneficial effect. Dr. Park said that the fall in the incidence of diphtheria following immunization of the population left no doubt as to its efficacy. He had found alum-precipitated toxoid, preferably in two or three doses, the best antigen. The duration of the immunity appeared to be long and the few reactions encountered were not severe. Dr. R. A. O'Brien of London said that immunization had protected nurses against grave infections when tending severe cases of diphtheria.

VIRUSES AND NEW GROWTHS

Dr. Peyton Rous of New York suggested that an association of viruses with cells was responsible for some neoplastic diseases. A tumor of the frog and numerous diseases of the domestic fowl had proved to be due to viruses. As to mammals, the wild rabbits of the Middle West of America frequently had skin papillomas caused by a virus, which in domestic rabbits produced vigorous growths, often metastasizing and on the brink of malignancy. All tumor phenomena could be explained in terms of what was known of viruses, yet it did not follow that the generality of tumors were actually caused by them.

THE MICROBIOLOGY OF CANNED FOODS

Prof. F. W. Tanner of Urbana, Ill., said that refrigeration did not destroy micro-organisms but only inhibited their activities. Foods subjected to quick freezing were perishable and should be kept frozen until ready for preparation for the table, if the development of food poisoning organisms was to be prevented. Some 10 per cent of canned meat products and 24 per cent of canned corn and over 50 per cent of canned pineapple harbored viable micro-organisms. The conditions that allowed them to survive should be studied. For ten years factory-canned food had not caused botulism in America, but home-canned foods continued to take their toll each year.

THE MECHANISM OF VIRUS IMMUNITY

Prof. J. C. G. Ledingham of London opened the discussion. He said that killed viruses conferred only the most trivial and ephemeral protection, though this might be a subsequent basis for reinforcement by the living virus. Dr. E. W. Schultz of Los Angeles stated that it had been established that the virus of poliomyelitis entered the central nervous system by the olfactory nerve. Serum prophylaxis and vaccines had not been proved to be effective, but recent observations indicated that temporary protection might be afforded by previous treatment of the nasal mucous membrane with chemical agents, which tended to diminish the permeability of the olfactory portal. Dr. G. W. M. Findlay of London said that more than 1,000 persons had been immunized against yellow fever by injections of immune serum and living virus. Serum from immunized horses produced reactions in from 10 to 15 per cent of cases, but human serum produced no serious reactions. Since immunization had been developed, no case of yellow fever had occurred among those exposed to laboratory infections.

Control of the Drug Traffic

A report of the measures taken by the British government to deal with the traffic in dangerous drugs has been issued. It describes the working of the system of control which has been established in this country, in accordance with the Hague and Geneva international conventions over the trade in these drugs, and the action taken in cooperation with other governments to suppress illicit traffic. Narcotic addiction is not prevalent in Great Britain. The total number of known addicts at the end of the year was about 700, of whom about 120 were physicians. In 90 per cent of the cases morphine was the drug of addiction, in 5 per cent cocaine and in 5 per cent diacetylmorphine. In all cases the drug was obtained through legitimate channels. In general the system of import certificates and export authorizations for the control of opium and other dangerous drugs has worked satisfactorily, though in a few cases difficulty has arisen owing to the use of languages other than the official ones of the League of Nations. The sale, prescription and dispensing of dangerous drugs in this country are under stringent regulations. A physician who violates them may have his right to purchase or prescribe such drugs withdrawn.

Safety in Coal Mines

The Royal Commission on Safety in Coal Mines has heard some important evidence as the result of the organized research that has taken place. It has been shown that coal dust can of itself produce explosions, which can be prevented or suppressed by stone dust. In regard to firedamp, Prof. R. V. Wheeler stressed the need for research in order to ascertain

details of the characteristics of the elements that constituted danger. Ignition was not instantaneous but occurred after a measurable interval, during which a series of chemical reactions, leading eventually to the production of flame, took place. Firedamp was remarkable for the long duration of the so-called lag on ignition. If the nature of the reactions that took place, particularly the primary reaction, could be identified, means of rendering ineffective some of the sources of ignition in a coal mine might be devised. The lag could be considerably delayed by the presence in the air of an inhibitor, the most effective yet discovered being iodine vapor. The dangers of explosions caused by shot firing at the coal face depended on the conditions in which it was used. The safest was to use an 8 ounce charge firmly secured by efficient stemming, which could be of moist clay and coarse sand. It did not seem possible to cause ignition of firedamp by a blown-out shot of a permitted explosive, provided the shot hole was stemmed. The danger of an overcharged shot could be considerably reduced and perhaps removed by the use of a sheathed explosive, in which the explosive was surrounded by a thin layer of sodium bicarbonate. With regard to mine rescue work, a gas mask that protected against carbon monoxide had been devised and could be made available for quick use, even by untrained men.

Sir Alfred Keogh

Sir Alfred Keogh, late director general of the army medical service, has died at the age of 79 years. An Irishman, he graduated from Queen's College, Galway. In 1880 he entered the medical corps of the army and passed through his training course with distinction. His promotion was rapid and he early showed a talent for administration, which afterward made him famous. He earned great distinction in the South African War and in 1902 became deputy director general and in 1905 director general of the army medical service. He was progressive and saw the importance of cooperation with the civil medical profession, especially in times of emergency, and he effectively organized this. When the great war broke out he had retired from the army. His experience and abilities were too great to be dispensed with in that supreme emergency. He was recalled and appointed director general in association with the then director general Sir Arthur Sloggett, who proceeded to France, while Keogh was at the war office at home. In collaboration with the leading consultants he organized hospitals for the wounded soldiers all over the country on a scale that had never before been necessary. He was a man of extraordinarily rapid decision, appearing to know instinctively the proper course, and a great judge of the capacities of men who worked under him. He thus became the greatest medical administrator the army has known.

PARIS

(From Our Regular Correspondent)

Aug. 8, 1936.

Compulsory Retirement of Physicians at Age of 65

The lower house of the French congress, the "Chambre des députés," corresponds to the House of Representatives in the United States. At the June 5 session of the Chambre des députés, a bill was introduced by Mr. Pomaret which was entitled "Proposition of Law tending to the immediate and steady employment of the youth of France." An examination of the bill reveals that it is not as innocent in its objectives as would appear from the title. It is directed at all members of the liberal professions, including physicians, so that diplomas will be rendered null and void whenever the holder has reached the age of 65 years, thus leaving room at the top for the intellectual youths who cannot secure a place even at the bottom of the ladder at the present time in France. Article 3 of the proposed law states that "no one can practice, even without pay, after the age of 65 years, as a lawyer, physician, veterinary, dentist, druggist, architect, surveyor, engineer, accountant, or as an executive in any commercial pursuit." No reference is made to the compulsory retirement at the age of 65 of a politician or those in the diplomatic service. This law should go into effect Jan. 1, 1939, it being understood that no pension can be given by the government to compensate those who are forced to retire.

In an editorial in the July 19 *Concours médical,* Noir states that although this proposed law had been spoken of, it seemed so unusual that it appeared to have germinated in the brain of some dreamer and need not be taken seriously. Alas, the bill had been introduced and hence called for vigilance on the part of organized medicine. A year ago the Medical Students' Association of France denounced such a proposition because it felt the injustice of compelling every physician to retire without a pension at 65, when the majority were unable to do so. Nine tenths of the intellectual youth here are sons or daughters of those at whom the law is directed. These young people know that in the majority of cases their parents are obliged to work beyond the age of 65 in order to pay for the education of the children until the latter are self supporting. Unless the parents have inherited money, relatively few, and this is especially true of physicians, have accumulated sufficient funds to live on the rest of their lives at the age of 65. Why those who occupy municipal, state or governmental positions should be exempted is not clear. Many physicians at the age of 65 have reached the acme of their career. Their experience, acquired during many years of study and practical application of their knowledge, is too valuable to the community to be thus thrown into the discard. The proposed law has aroused such antagonism on the part not only of members of the professions enumerated but of the people at large that there is little likelihood of its ever coming to a vote. The younger intellectuals are as opposed to it as those whom it is supposed to push aside to make room for them.

Fifth French Gynecologic Congress

This year's congress of French gynecologists was held at Paris, May 18-21. The honorary president was Professor Alfieri of Milan and the presiding officer was Professor Dartigues of Paris. The subject chosen for discussion was "Sterility in the Female," five papers being read.

Charles Champy of Paris presented the first of these, on "Physiology of Fecundation and Nidation (Fixation) of the Ovum." In the discussion of this paper, Claude Béclère of Paris stated that the integrity of spermatozoa is rarely a cause of sterility and that it was necessary to take into consideration the physiologic rôle of the male adnexa and the cervix uteri, and the indispensable integrity of the tubal mucosa.

Turpault of Paris called attention to the acidity of the vaginal secretion, to the corpus luteum and the integrity of the endocervical glands.

Jean Seguy of Paris read a paper on "Etiology and Clinical Aspects of Sterility." In the discussion, Cova of Turin believed that one was inclined to exaggerate the rôle assumed by vaginal acidity. Frigidity on the part of the female, which is often associated with ovarian dysfunction, may be responsible for the sterility. For Turpault the function of the liver, the hydrogen ion concentration of the blood, syphilis and intestinal infection play an important part. Gaifami of Rome considers the existence of tuberculosis during infancy and childhood worthy of serious consideration. Vanverts of Lille mantained that fecundation may take place even when lack of development, displacements (uterine), tumors (uterine and ovarian) and stenoses exist. Many women remain sterile for from five to fifteen years and become pregnant after all hopes have been abandoned, wherefore one ought to be guarded as to prognosis. Cotte of Lyons thought that trichomonas infections do not prevent fecun-

dation. Mechanical causes, except tubal occlusion, are less important than biologic disturbances, vaginal acidity, altered cervical secretion and changes in the endometrium. Labhardt of Basle maintains that the widespread use of contraceptive methods is responsible for endometritis and salpingitis by rendering it more difficult for the ovum to become fixed. He had observed a larger number of extra-uterine pregnancies in his service since contraceptive methods had been employed.

Douay of Paris was of the opinion that male causes play a far less important part than those in the female. After having employed insufflation for determining the patency of the tubes, he has resumed the use of iodized oil.

A third paper on "Medical and Surgical Treatment of Sterility," was read by André Chalier of Lyons. Obliterated tubes can be rendered permeable by insufflation or injection of iodized oil as well as by numerous plastic operations. In sterility of ovarian origin, the treatment of obesity and syphilis are especially indicated. About half of the cases of sterility are curable, but the others often resist all therapy. In the discussion, Cotte of Lyons preferred resection of the presacral nerve for vaginism. Electrocoagulation, according to the method of Filhos, is best for cervicitis and insufflation to render the tubes permeable. In genital hyperexcitability, presacral nerve resection is often combined with partial resection of the ovaries. Mongie of Bordeaux emphasized the necessity of alkalization of the vaginal medium.

The last paper was by Favreau of Lille on "Thermal and Physical Therapeutic Methods." The merits of each of the many thermal stations in France were taken up. High frequency treatment should never be undertaken unless a definite indication existed. Claude Béclère, in the discussion, stated that in the majority of cases a cervicitis was accompanied by lesions in the tubes and ovaries, for which reason a diathermy and thermal resort treatment was necessary as a preliminary measure.

BERLIN

(From Our Regular Correspondent)

July 21, 1936.

Convention of the German Roentgen Society

This year's convention of the German roentgenologists was held at Wiesbaden in April; the first session was held in conjunction with the internists, the joint meeting representing the final session of the latter group. Kalk, clinician, and Knothe, roentgenologist, submitted their respective papers on "Inflammatory Diseases of the Colon." Kalk said that treatment of a single section of the intestinal tract was most unsatisfactory since the local alterations are often only secondary or, conversely, may be followed by modifications in other organs. He pointed out the efficacy in colitis gravis of alterative anaphylaxis treatment with horse serum and plenty of vitamins. He cautioned against enemas of various kinds. Kalk considers true colica mucosa a neurosis of the secretory nerves.

In the roentgenologic paper, Knothe reviewed the progress of diagnostic methods. Roentgen examination must be competently carried out and each of a number of details must be observed. The roentgenologic picture in the three stages of colitis is sufficiently characteristic. Of particular importance is the determination of the seat and the extent of the pathologic changes. Tuberculosis too is plainly recognizable. Not infrequently there exists a considerable discrepancy between the clinical picture and the roentgenologic appearances.

Alexander of Agra next submitted a paper on the "Diagnosis of Tuberculous Cavities." There are important differences between the round cavities which originate from an early infiltrate in the pulmonary tissue of normal elasticity and the thick walled tertiary cavities and their accompanying symptoms (pleural induration, atelectasis). Chaoul of Berlin, roentgenologist of the Sauerbruch clinic, demonstrated how by means of tomograms the large bronchi can be given an isolated representation. By separation of the lung roentgenograms into a series that portrays various sectional layers the number, situation, shape and size of tuberculous cavities can be established.

The third paper, "Short Wave Therapy in Internal Medicine," was delivered by Schliephake of Giessen, who discussed the results of research on the distribution of short wave energy in homogeneous and layered mediums. The depth and intensity of the effect is dependent on the wavelength, on the size of the electrodes and on their distance from the body surface. The heat effect from short wave therapy is of trivial and distinctly secondary importance when compared to that of long wave diathermy. Methods for accurate measurement of function and determination of dosage have yet to be evolved. Short wave therapy will be indicated principally in suppurating infections (such as furuncles, carbuncle, abscesses and gynecologic inflammations), rheumatic-arthritic disorders and certain circulatory disturbances. For the last named a weak energy is indicated, but for rheumatic joints considerable energy should be used. Numerous astonishing successes in cases of pulmonary abscess have been authenticated. Schliephake holds faulty dosage responsible for lack of success in inflammatory diseases. Too weak energy will be ineffective, whereas overdosing will tend to break down the leukocytic bulwark of defense. Knowledge of this sort is essential if short wave therapy is to be successfully carried out. Injudicious application has unfortunately tended to give the method a bad name.

Holthusen of Hamburg submitted a report on "Prevention of Injuries from Roentgen Rays." Among possible harmful after-effects may be mentioned changes in the connective tissues, diminished reproductive function and increased susceptibility to infection in various tissues. Just as it is impossible to estimate the size of the dosage that will destroy a tumor, so it is likewise impossible to delimit the severity of ill effects incurred by the treatment. The critical region in Coutard and radium irradiation lies between two and one-half and six erythema doses, or between 4,500 and 11,000 roentgens. The cause of this latitude of efficacy is to be found in the vast variation of individual sensitivity rather than in the fluctuations of dosage. The total dosage for single areas of tissue, especially with regard to the overlapping of the ray cones, is to be considered a possible source of injury. The circumstances may also be complicated by the combined use of radium and roentgen irradiation. It has been assumed for some time that the musculature and the glandular functions are particularly sensitive. Permanent epilation by roentgen rays is contraindicated as too hazardous. Particular caution should be exercised when persons in the growing stage are subjected to the rays.

Of the technical papers, that of Ziedses des Plantes of Utrecht on "Seroscopy" is particularly worthy of mention. Seroscopy is a roentgenographic procedure which makes it possible, by means of numerous exposures, to examine an endless series of consecutive parallel planes. Thanks to this ingenious device, the object, a skull for example, pictures of which are taken from various angles, may be examined according to layers, as it were, just as a preparation may be microscopically studied by turning of the micrometer screw.

In his discussion of "Artificial Radioactivity" von Bothe of Heidelberg considered the risk involved in the use of neutron rays, the formation of gamma radiation of 2,000 kilovolts by the absorption of neutrons in water, and the production of artificial radioactivity by means of artificial transformation of the elements. The neutron rays appear to be extremely powerful from a biologic standpoint; rats can be killed by them. This type of irradiation possesses double the hardness of gamma irradiation.

New Regulations for the Insurance Physicians

Several new regulations or decisions have been made recently with regard to the activities of the sick insurance physicians.

The proper authorities have decided that physicians of both sexes by virtue of admission to the insurance practice are to be considered fundamentally as equals. A woman physician must not be superseded by men physicians merely because of her sex. Women insurance holders, on the other hand, cannot demand that medical attention be administered them by women physicians. And if female patients can no longer demand treatment by physicians of their own sex, neither have the male patients any particular right to demand that men physicians attend them.

The insurance practice can now be engaged in only as the physician's principal professional activity. For example, a physician regularly employed outside the insurance practice and the duties of whose post take up most of his time cannot, in addition, serve as an insurance physician.

If a physician should perpetrate an illegal abortion, such an offense should be considered grounds for the revocation of his insurance practice license.

A further decree issued by the director of the Berlin office of the Insurance Physicians' League may be mentioned. It has to do with the question of the consulting room. The members of the insurance societies, it seems, have been increasingly vociferous in their complaints that many physicians maintain separate waiting rooms for private patients and for insurance patients. This arrangement had caused the insured to feel that they were being treated as an underprivileged group and had aroused unrest among them. Discrimination of this sort with regard to patients is contrary to the spirit of National Socialism. Hence the present decree prohibits the maintenance of the separate waiting rooms and, in addition, forbids any separation of consulting hour periods along the same lines.

Jubilee Celebration at Heidelberg

In the last days of June and the first days of July, Heidelberg University celebrated its 550th anniversary with great pomp and circumstance. For some time previously, this jubilee had been discussed in both the German and the foreign press. Twenty countries sent delegations. The United States sent representatives of eighteen universities. Harvard University accepted the invitation and invited the German universities to send their representatives to the Harvard anniversary celebration in September. Heidelberg was richly caparisoned for the reception of its guests, among whom were many of the university alumni from all parts of the world; former American ambassador Shurman was present. The German civil authorities, the army and the National Socialist party were abundantly represented. At a great reception sponsored by the national government, the minister of public instruction, Dr. Goebbels, delivered an address of welcome, in which he said that the endeavor of the entire German people should be to achieve that openmindedness toward life and enjoyment of life for which Heidelberg had always stood. The Heidelberg rector, Professor Groh, a jurist, said that the government took this opportunity to demonstrate the devotion of the new Germany to the task of universal civilization and its sponsorship of high intellectual achievement in all fields of learning, on all fronts of the most peaceful struggle in the world. He declared that at no period of its long history had German scholarship been so liberally aided as in this, our new National Socialist Germany. We feel it as a supreme good fortune, he continued, that the ancient antagonism between politics and learning is no longer an issue. These statements may be compared with the recent statement of the bishop of Durham with reference to the dismissal of faculty members by German universities: He said that "in this evil process Heidelberg stands in the forefront" (Herbert Dunelm, Bishop of Durham, Auckland Castle, the *Times* [London] Feb. 4, 1936, p. 13). The festival was rendered impressive by the foreign professors in academic garb, who offered their felicitations with the most disparate tokens of friendship. Professor Bohle of South Africa, for example, extended additional greetings from the foreign organization of the National Socialist party and the rector of the University of Canton, China presented a silken banner on which was embroidered a swastika. A different note was sounded by the Swiss jurist Professor Siegwart, who represented the three German-speaking and the three French-speaking universities of Switzerland and whose home city, Freiburg, stands on a linguistic divide. Switzerland, he said, offers an example of the peaceful and untrammeled cooperation of two cultures.

Rust, the national minister of higher education, sought to elucidate the attitude of the National Socialist state toward the universities and toward learning in general. National Socialism has not come to make regulations for higher education or to rob learning of its independent character. . . . Learning is both free and dependent in equal measure, free in its methods of treating reality, dependent on the life of the people. Rust further told how individual branches of learning had been structurally renovated on the basis of the popular weltanschauung. Fears have been expressed that National Socialism has placed learning in the degraded position of handmaid to the political power. These politico-academic activities are the expression of a dominant principle of the National Socialist movement. The movement has a mission to restore to the German people a belief in their substance and this work must not be jeopardized by any unworthy tolerance of what is inimical to renascent national self confidence. For this reason those unteachable enemies of Germany's reascent, the Marxist gainsayers of national principle, have been banished from public life. National Socialism contends that a learning devoid of certain preconceptions and ethical foundations would be practically impossible. Rust then emphasized the union of human beings according to community of race and tradition. Learning can be systematic only if based on a living weltanschauung. Weltanschauung is a fertile ground; the German state of 1933 would never have become great without it. It suffuses life with a new wisdom, but it does not supplant learning. National Socialism has not come to make regulations for learning or to rob learning of its freedom; it has come to provide learning with a new foundation. The academician who talks politics will not be tolerated. True academic autonomy and freedom exist when learning is a spiritual force, at one with the living energies of the people and obedient to the law of truth.

The rector of Heidelberg University, Professor Groh, was promoted by the upper führer of the storm troops to the rank of sturmführer (a title which would roughly correspond to that of "colonel" in the regular army). This promotion took place a few days after the close of the jubilee festivities. The façade of the new university building at Heidelberg, on which had previously appeared the inscription "To the Living Spirit" together with a sculptured Pallas Athena, bore instead on the occasion of the jubilee the inscription "To the German Spirit" together with a bronze eagle. Pallas Athena, a confidence-inspiring symbol of truth to Heidelberg students of an earlier day, has been relegated to the rear of the building. The celebration was the occasion for the conferring of forty-three honorary degrees. The following residents of the United States received honorary doctoral degrees from various faculties of Heidelberg University: from the Faculty of Philosophy, Prof. Dr. Kirsopp Lake of Harvard University; from the Faculty of Medicine, Prof. Hamilton Laughlin of Cold Spring Harbor, N. Y., eugenist of the Carnegie Institution; from the Faculty

of Jurisprudence, Dr. (honoris-causa) Ferdinand Thun of Reading, Pa. The Faculty of Jurisprudence bestowed a like degree on William May Garland of Los Angeles for his sponsorship of peaceful competitions between the nations (the Olympic games). The doctor's degree was further conferred on Prof. Reginald Aldworth Daly of Harvard by the Faculty of Natural Science and Mathematics. Henry K. Jannsen of Reading, Pa., was similarly honored by the Faculty of Political Science and Economics.

SWITZERLAND

(From Our Regular Correspondent)

June 20, 1936.

Humanitarian Enterprises

Switzerland possesses, among other humanitarian enterprises, three great welfare organizations: Pro Juventute, Pro Senectute and Pro Infirmis. The names of these organizations imply their functions. They enjoy the sponsorship of the federal government as well as of the public. This year the Swiss minister of foreign affairs, Federal Councilor Motta, has taken a special interest in the activity of the Pro Infirmis organization, which concerns itself with aid to the indigent infirm. In Switzerland around 200,000 (5 per cent) of the population present some somatic or psychic abnormality. Included in this number are the blind, the deaf, the hard of hearing, the maimed, the decrepit, the feebleminded and persons presenting any other type of impaired development. By circularizing the public with specially illustrated post cards, the organization was able during the year 1935 to collect the sum of 270,000 francs.

Several recent medical reports on this type of welfare activity are of interest. Professor Schlittler of Basel, for example, announces that the Basel School for the Hard of Hearing, enlarged until it now constitutes an eight-grade school, has in the course of the last twenty years provided a regular schooling for a vast number of children whose hearing is defective and has trained these children to become self-confident and efficient human beings. Similar schools are to be found in Zurich, Bern, Lucerne and other cities. For country school children whose hearing is impaired, a special service has been set up by which their transfer to one of the urban schools for the hard of hearing is effected and it is seen to that these children are suitably lodged while in the city in question. In the last six years more than eighty children from rural communities have been transferred to the urban schools for the hard of hearing and in some cases the Pro Infirmis association has assisted financially in this work.

In Zurich there has existed since 1933 a special kindergarten for children afflicted with deaf-mutism or other defects of hearing. After two years of experimentation, Professor Nager, otologist, of Zurich, reports that these children have made remarkable progress. It was amply demonstrated that instruction of the children should begin precisely at that stage of development which is characterized by an especially lively instinct of imitation and in which normally a child feels an urgent need for conversation and for an understanding of his surroundings. Whereas, according to earlier educational methods, this period was allowed to remain unutilized in the teaching of the deaf, this period is now filled by preschool instruction and infinitely better results can now be anticipated. At the same time the Zurich kindergarten serves as an observation center wherein the etiology of defective speech development in the children may be traced. In the course of a physician's consulting hours such investigations can obviously yield only approximate data, but at the kindergarten a child easily becomes adjusted to the environment and remains under the constant observation of specialists. The parents too can here become conversant with the educational procedures especially adapted to children with deaf-mutism or seriously impaired hearing.

The children of the kindergarten have become lively and happy in this environment, whereas previously many of them had been excluded from normal contacts and play within their own family circles and been forced to remain apart. In Geneva a similar kindergarten has been in existence for several years. According to investigations undertaken there, 3 years is likewise considered the optimal age at which a child should be admitted to the institution.

The Migration of Virus Along Peripheral Nerves

A recent discussion of the migration of virus along the peripheral nerves by Robert Doerr, professor of hygiene at Basel, contained some observations that are of fundamental importance. It is widely assumed that certain types of virus travel by their centripetal migration in the axis cylinders, while tetanus toxin on the other hand may be passively assisted by fluid currents in the perineural spaces of the central nervous system. A critical analysis of the literature leads one to conclude that the two alternatives ("active growth or passive transport" and "axis cylinder or perineural lymph spaces") do not exhaust all the possibilities. Doerr describes observations that seem to substantiate this hypothesis. The point of departure is the establishment of the velocity of migration of the virus of herpes in the trigeminal tract leading from the rabbit's cornea to the brain by estimating the minimal interval of time at which the virus is demonstrable in two successive points of the tract (gasserian ganglion and sensory trigeminal nucleus on the inoculated side). There resulted surprisingly few values that were not in accord with the concept of an ordinary progress of the infectious process, which moreover spread centripetally with absolute constancy and in even tempo. The establishment of a concentration of virus in the passage as well as the fact that the migratory process remains completely latent functionally and frequently exhibits no histologic changes, speaks further against an "ascending infection." Moreover, Magrassi has been able to show that that strain of herpes which develops no encephalitis filters through the trigeminal tract, reaches the brain and quickly produces a cerebral immunity. Implanted directly into the brain, the "nonencephalitic pathogenic" strains develop, however, a maximal capability of infection whence the conclusion follows that the "schieneninfektion" (track infection) must be directed by a special mechanism. This may be satisfactorily explained either by an ordinary infection of the nerves or by a purely passive transport of virus. The phenomenon of "opposing manners of infection" observed by Magrassi allows itself to be evaluated in the same sense. When rabbits were subjected first to peripheral and then, after an interval, to intracerebral inoculations with encephalitogenic strains the "schieneninfektion" and the direct cerebral infection canceled each other. The animals thus survived both interventions without exhibiting any symptoms, whereas any single one of the two infections inevitably was fatal. The results of experiments with intravascular injections of the virus of herpes make it necessary to alter the prevalent concept of more fixed and more highly differentiated special neurotropisms. According to the vessel selected, either a primary myelitis or a primary encephalitis can be produced. The nerve conduction theory of tetanus toxin (H. H. Meyer) can now be supported by a new argument (the dynamic activation of the toxically induced local tetanus). Since the detection of toxin in the ischiatic nervous tract succeeds only when the circumstances offer conclusive proof of the positive condition, a passive transport by currents in the perineural lymph spaces must be concluded. According to H. H. Meyer's theory it is necessary to bring into consideration other toxins (diphtheria, botulinus, Shiga) in order to answer the question of what properties an agent must possess in order to be absorbed and conducted by the nerves.

VIENNA

(From Our Regular Correspondent)

July 7, 1936.

Causes of Death Among the Viennese

The Federal Bureau of Statistics has at last made public complete statistics on the causes of the deaths that occurred in Vienna during 1933 and 1934. Diseases of the heart and vascular system occupy first place (male patients 17.2 per cent, female patients 20.5 per cent); the next ranking cause was malignant tumors (male patients 12.3 per cent, female 14.5 per cent). Third place is occupied for males by tuberculosis (9.6 per cent), for females by pneumonia (8.3 per cent); conversely, in fourth place is pneumonia with 8.3 per cent among males and tuberculosis with 7.9 per cent among females. The incidence of fatalities from different causes and the relative endangerment of the populace by various diseases have been computed per hundred thousand of population. According to this report virtually all diseases underwent a decrease. The death rate from cardiac and vascular disorders has sunk from 234.4 to 231.3 per hundred thousand of population. On the same basis the mortality from tuberculosis has declined among males from 141.5 to 128.5, among females from 100.7 to 93.4. The decline in the number of suicides, from 59.3 to 53.9 per hundred thousand among males and from 25.2 to 24.3 among females, is gratifying. Only fatalities from malignant tumors showed an increase among males from 157.3 to 164.1 per hundred thousand. The following detailed data can be quoted: The 24,808 fatalities recorded in 1933 were apportioned according to cause as follows: infectious diseases 3,658 (including 2,337 deaths from tuberculosis of the respiratory tract), cancer 3,998, diabetes 402, diseases of the blood 248, diseases of the nerves and of the organs of sense 2,485, diseases of the circulation 5,661 (of which 4,376 were from organic heart disease), diseases of the organs of respiration 2,724 (of which 1,971 were from pneumonia and costal pleurisy), diseases of the digestive system 1,504, diseases of the genito-urinary system 746, deaths occasioned by pregnancy and the puerperium 113. In addition, 391 children died in the first year of life and 686 persons succumbed to the infirmities of age. There were also a number of violent deaths, 1,235 of which were suicides.

Has the Patient a Right to His Case Record?

An interesting decision recently handed down by the Supreme Court of Judicature marks another pronouncement on the physician-patient relationship. A male patient had been admitted to a private sanatorium for treatment for an intoxication caused by a hypnotic. The treatment had been successful but the patient decided to institute a personal injury suit against the manufacturer of the drug in question. To strengthen his allegations, he wished to make use of the clinical history of his illness and requested the attending physician to furnish him this record. When the doctor and the sanatorium denied his request the man brought legal action against both, demanding the delivery of the record. The defense contended that the histories of patients are in the nature of an attending physician's private notations, intended solely for his personal use, that such records should never be accessible to a patient and that, furthermore, if the plaintiff wished to sue the pharmaceutical concern he could have the members of the sanatorium staff subpenaed as medical witnesses. But the legal duty of professional secrecy, the defense concluded, prohibits the surrender of a case record by a physician.

The medical experts who testified in this case were of the opinion that case records were to be regarded as a physician's personal property and that under no circumstances should a patient be permitted access to them and, further, that a universally recognized principle of professional ethics forbids the physician to furnish a patient full information on the latter's physical condition if such intelligence might upset the patient's mental equilibrium. It must therefore remain within the discretion of the physician whether he wishes to supply a patient with the case history.

On the basis of this expert opinion the Supreme Court dismissed the suit. The decision specifically stated that a patient has no right to demand access to the record of his case if the physician considers the divulgence of the data therein contained contraindicated for psychologic reasons. There exists accordingly no legal avenue by which the plaintiff may become acquainted with the etiology and clinical course of his malady. In case action is brought against a pharmaceutical manufacturer, the court itself may impound medical records for its own guidance in the formulation of a judgment; but the relinquishment of a medical record cannot be legally claimed by private persons, and the plaintiffs in the present or in any similar case are to be regarded as such.

The New Electropathologic Institute

The Electropathologic Museum, previously housed at the Institute of Forensic Medicine, has been moved to new quarters in the former Garrison Hospital. The institute was founded thirty-five years ago by Prof. Stephan Jellinek and still remains under his direction. As it is the only establishment of the kind in the entire world, engineers and physicians of every nationality throng there to study problems in the field of electropathy. The museum contains many exhibits of unusual and unique interest; for example, a valuable historical collection on electricity. Among the activities of the institute may be mentioned recent research on prevention of electrical accidents, on improvements in industrial safety and on kindred problems.

Among other exhibits lodged in two great halls are a special collection of material illustrative of the effects of lightning, sections on protection against electricity, the application of electricity to military science, electromedical apparatus and electropathology in everyday life. In addition there are the laboratories and a lecture hall. The institute has become particularly important in recent years for its work on those forensic problems which have been created by the daily use of electrical appliances. In the school conducted by Professor Jellinek at this institute a number of the most eminent research scholars in the field have received their training.

RIO DE JANEIRO

(From Our Regular Correspondent)

July 15, 1936.

Immunotransfusion

Dr. Cruz Lima, director of the blood transfusion center in Rio de Janeiro, in a recent lecture reviewed the work of Wright and his school on immunotransfusion. The speaker differentiates three types of immunotransfusion: true immunotransfusion (conferring immunity), prophylactic transfusion (conferring protection) and allergic transfusion (transmitting allergy). The speaker reported the results of the three different types of transfusion in a group of eighty patients suffering from infections. Immunotransfusion was given to fifty-eight, simple transfusion to fourteen and both types of transfusion to eight. Recovery took place in twenty-seven patients out of the group of fifty-eight who were treated by immunotransfusion, the condition did not change in one and there were thirty deaths (51 per cent). Recovery took place in two patients in a group of fourteen who were treated by simple transfusion, the condition did not change in one and eleven patients died (78 per cent). In the group of eight patients who received both types of transfusion, four recovered and four died (50 per cent). The results point to the advantage of using immunotransfusion in infections. A comparison of the effects of immunotransfusion in different infections gives the

following results: In twenty-five cases of streptococcic infections complicated by septicemia there were nine recoveries and sixteen deaths; in twelve cases of staphylococcic infections there were six recoveries and six deaths; in sixteen cases of infections of unknown origin, especially from pyogenic bacteria, there were eleven recoveries and five deaths. In all cases of myocardial involvement there was a fatal outcome, which shows the importance of early suppression of the focus of infection. In seven cases of typhoid treated by immunotransfusion there were two recoveries and five deaths. Transfusion in these cases was performed in desperately grave cases. In the group of thirty-two patients who died after having received immunotransfusion, ten patients (29 per cent) were given transfusion in the last twenty-four hours before death. It is advisable to perform immunotransfusion early in the development of infections, in sufficient dose (from 400 to 500 cc.) and repeat it at least every forty-eight hours. By the speaker's observations it seems that immunotransfusion is contraindicated in cases of latent tuberculosis, which seems to enter on activity by immunotransfusion.

Congress of Orthopedics

The First Brazilian Congress of Orthopedics and Traumatology met July 1-3, in São Paulo. There was a large attendance of Brazilian orthopedic surgeons. Those who met previously at the reunion of the Orthopedic Regional Society of Rio de Janeiro were also present. Prof. Vittorio Putti, guest of honor of the congress and of the government, delivered his first lecture at the inaugural session, on orthopedic surgery in contemporaneous medicine. Dr. Barros Lima, professor of the Faculty of Medicine of Recife and president of the Orthopedic Society of the northern region of Brazil, spoke on tuberculosis of the bones. Dr. Resende Puech described his technic of anterior tibiotarsal arthrodesis, with bone implantation, in treatment of paralytic calcaneous foot.

Maternity Hospital for Tuberculous Women

Festivities were held by the Associação de Soccorros aos Tuberculosos on occasion of the opening of the Placido Barbosa pavilion for the care of pregnant tuberculous women. The pavilion is part of a maternity hospital which is in construction and which is in connection with the São Sebastião Hospital. The institution covers a need in the care of tuberculous women that previously had not been given the attention it deserves.

Marriages

ARTHUR ALLAN HUMPHREY, Battle Creek, Mich., to Miss Frances Adelaide Whalen of Fort Wayne, Ind., September 2.

CHARLES SALTZMAN, Loch Sheldrake, N. Y., to Miss Frances Selma Heller of Brookline, Mass., recently.

ARTHUR STRAUSS, Long Branch, N. J., to Miss Winifred Armstrong of Rumson, in New York, July 30.

REYNOLD ERSKINE CHURCH, New York, to Miss Mary Eltinge Ostrander of White Plains, June 25.

ERLAND MYLES STANDISH, Wethersfield, Conn., to DR. HILDA C. CROSBY of Hartford, June 25.

ROBERT MAYES SEAWRIGHT to Miss Margaret Alsobrook, both of Bolton, Miss., July 24.

LOUIS BLACK LEE, Tiltonville, Ohio, to Miss Blanche Allen of Washington, D. C., July 4.

DONALD MARION CALDWELL, Irvington, N. J., to Miss Mabel Wood of New York, July 6.

CLYDE HOBSON FOSHEE, Madisonville, Ky., to Miss Isabel Board of Louisville, June 6.

HARVEY M. FRY, Rush, Pa., to Miss Ruth H. Payne of Montrose, July 24.

ABRAHAM H. BARRIS to Miss Sadie Furman, both of New York, July 4.

DAVID WILLIAM FEY to Miss Wilma Buehler, both of Peoria, Ill., June 20.

Deaths

Clarence King ⊕ Cincinnati; Medical College of Ohio, Cincinnati, 1901; member of the American Academy of Ophthalmology and Oto-Laryngology and the American Ophthalmological Society; fellow of the American College of Surgeons; professor of ophthalmology, University of Cincinnati College of Medicine; served during the World War; director of the ophthalmic service, Children's Hospital; attending surgeon to the Cincinnati General Hospital and director of the outdoor clinic; ophthalmologist to the Christ Hospital; at various times served on the staffs of the Ophthalmic Hospital, Good Samaritan Hospital and Deaconess Hospital; was active in the establishment of the laboratory of ophthalmic pathology at the Christian R. Holmes Hospital; aged 57; died, August 15, while swimming at Grape Bay, Hamilton, Bermuda.

Frank Richard Oastler ⊕ New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894; professor of clinical gynecology at his alma mater; attending gynecologist to the Lenox Hill Hospital; consulting gynecologist and obstetrician to the Lincoln Hospital; consulting surgeon to St. Luke's Home for Aged Women; consulting gynecologist to St. Luke's Hospital, Newburgh; fellow of the American College of Surgeons; aged 65; died, August 2, in Glacier National Park, Mont., of coronary occlusion.

William McDonald Jr., ⊕ Marion, Mass.; Columbia University College of Physicians and Surgeons, New York, 1899; at one time clinical instructor in neurology at Yale University School of Medicine, New Haven, Conn.; served during the World War; at various times on the staffs of the Butler Hospital and Rhode Island hospitals, Providence, R. I., Sayles Memorial Hospital, Pawtucket, R. I., and the New Haven (Conn.) Hospital; aged 63; died, August 1.

Ira Dean Loree ⊕ Ann Arbor, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1901; member of the American Urological Association; fellow of the American College of Surgeons; assistant in surgery at his alma mater from 1901 to 1907 and associate professor of surgery from 1907 to 1920; for many years on the staff of St. Joseph's Mercy Hospital; aged 67; died suddenly, August 10, at his home in Barton Hills.

Edward John Riley ⊕ New York; Albany (N. Y.) Medical College, 1908; assistant clinical professor of medicine, New York University College of Medicine; served during the World War; for many years police surgeon; aged 51; consulting physician to St. Ann's Maternity and St. Elizabeth's hospitals, New York, and St. Joseph's Hospital, Yonkers, N. Y.; attending physician to St. Vincent's Hospital, where he died, August 3.

Robert Kendig Rewalt ⊕ Williamsport, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; past president of the Lycoming County Medical Society; member of the American Academy of Pediatrics; served during the World War; for many years chief of the pediatric service, and member of the board of managers of the Williamsport Hospital; aged 49; died, July 27, of cerebral hemorrhage.

George Joseph Hauer, New Orleans; Tulane University of Louisiana Medical Department, New Orleans, 1912; member of the Louisiana State Medical Society; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; served during the World War; on the staff of the Touro Infirmary and French Hospital; aged 46; died suddenly, June 2, of chronic nephritis and myocarditis.

Alfred Benedictus T. Lippert, Sidney, Ohio; Miami Medical College, Cincinnati, 1896; member of the Ohio State Medical Association; for many years a medical missionary in West Africa; formerly director of the child hygiene division of the state department of health at Columbus; health commissioner of Shelby County; aged 61; died, July 1, in Rochester, Minn., of carcinoma of the stomach.

Aloysius James Larkin ⊕ Chicago; Rush Medical College, Chicago, 1916; associate in radiology at Northwestern University Medical School; aged 47; author of a book called "Radium in General Practice"; at various times on the staffs of St. Francis Hospital, Evanston, Ill., University, Cook County, Evangelical, Edgewater and Wesley Memorial hospitals, where he died, August 20, of coronary occlusion.

Thomas Scott Ragland, ⊕ Gilmer, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1894; past president and secretary of the Upshur County Medical Society; formerly county health officer; for many years bank president;

medical superintendent of the Ragland Clinic-Hospital; aged 64; died, June 19, as the result of injuries received in an automobile accident.

John Milton Walker ✠ Kansas City, Mo.; Tulane University of Louisiana School of Medicine, New Orleans, 1913; member of the Associated Anesthetists of the United States and Canada; served during the World War; on the staffs of St. Joseph Hospital and the Trinity Lutheran Hospital; aged 45; died, June 11, of lobar pneumonia.

O. Grant Harrington ✠ Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1895; past president of the Niagara Falls Academy of Medicine; at one time coroner of Lewis County, N. Y.; member of the staffs of the Mount St. Mary's and Memorial hospitals; aged 69; died, June 1, in Lowville, of coronary thrombosis.

William Charles Vickers, Abbeville, Ala.; Tulane University of Louisiana Medical Department, New Orleans, 1908; member of the Medical Association of the State of Alabama; past president of the Henry County Medical Society; veteran of the Spanish-American War; formerly county physician; aged 53; died, June 7.

Charles Benjamin Sprague, Troy, N. Y.; University of Vermont College of Medicine, Burlington, 1898; member of the Medical Society of the State of New York; formerly a county coroner; aged 64; for many years on the staff of the Leonard Hospital, where he died, June 7, of chronic nephritis and myocarditis.

Thomas Verner Moore ✠ San Jose, Calif.; John A. Creighton Medical College, Omaha, 1911; fellow of the American College of Surgeons; served during the World War; on the surgical staff of the San Jose Hospital and O'Connor Sanitarium; aged 52; died, June 6, of adenocarcinoma of the stomach.

Charles Sumner Hamilton ✠ Columbus, Ohio; Columbus Medical College, 1887; emeritus professor of surgery, Ohio State University College of Medicine; served during the World War; aged 72; on the staffs of the Children's Hospital and Mount Carmel Hospital, where he died, June 26, of heart disease.

William Louis Hartman, Highland Park, Mich.; Hahnemann Medical College and Hospital, Chicago, 1887; fellow of the American College of Surgeons; medical director of the New York Central Lines; aged 68; on the staff of the Grace Hospital, Detroit, where he died, June 1, of cardiorenal disease.

George Willis Robinson ✠ New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1932; assistant clinical professor of ophthalmology at the Louisiana State University Medical Center; on the staff of the Charity Hospital; aged 28; was drowned, July 19, at Grand Isle, La.

Frank Bryant Horner, Campbellsburg, Ind.; University of Louisville (Ky.) Medical Department, 1913; member of the Indiana State Medical Association; formerly county coroner; aged 51; died, June 6, in the Pennington General Hospital, London, Ky., of injuries received in an automobile accident.

James Henry Thorpe ✠ Owensboro, Ky.; Barnes Medical College, St. Louis, 1899; past president of the Daviess County Medical Society; member of the staff of the Owensboro City Hospital; consultant surgeon to the Mary Kendall Home; aged 60; died, June 6, of carcinoma of the stomach.

Lucien Luttrell Miner ✠ Los Angeles; Columbia University College of Physicians and Surgeons, New York, 1904; fellow of the American College of Surgeons; at various times on the staffs of the Hospital of the Good Samaritan and Hollywood Hospital; aged 57; died, June 5, of heart disease.

Bernays Kennedy, Indianapolis; Medical College of Indiana, Indianapolis, 1898; served during the World War; at one time associate professor of gynecology, Indiana University School of Medicine; aged 63; died, June 29, in Duluth, Minn., of diabetes mellitus and coronary sclerosis.

Vernon Champney Stewart ✠ Woburn, Mass.; Columbia University College of Physicians and Surgeons, New York, 1904; formerly medical examiner for the Woburn district; on the staff of the Charles Choate Memorial Hospital; aged 56; died, June 20, in New Ipswich, N. H.

Daniel W. McMillan, Pensacola, Fla.; Tulane University of Louisiana School of Medicine, New Orleans, 1893; member of the Florida Medical Association; served during the World War; aged 67; died, August 4, in a local hospital following an operation for appendicitis.

William Wadsworth Stirlen, Muscatine, Iowa; Keokuk Medical College, College of Physicians and Surgeons, 1905; member of the Iowa State Medical Society; aged 55; on the staff of the Benjamin Hershey Memorial Hospital, where he died, June 9, of septic endocarditis.

Thomas James Glenn, Cincinnati; Medical College of Ohio, Cincinnati, 1908; member of the Ohio State Medical Association; aged 52; on the staff of the Good Samaritan Hospital, where he died, June 27, of septicemia and subacute endocarditis.

Abram Harvey Van Riper, Nutley, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1878; at one time postmaster; aged 82; died, June 26, in St. Mary's Hospital, Passaic, of pulmonary embolism.

George Eugene Ober ✠ Bridgeport, Conn.; University of Vermont College of Medicine, Burlington, 1890; past president of the board of health; aged 73; died, June 11, in a local hospital of perforated duodenal ulcer and general peritonitis.

Elmer Lee Ruble ✠ Kansas City, Mo.; University Medical College of Kansas City, 1905; served during the World War; member of the staffs of the Wesley Hospital and St. Mary's Hospital; aged 55; died, June 1, of heart disease.

Austin James Kemp, Miami, Fla.; University of Nashville (Tenn.) Medical Department, 1903; member of the Florida Medical Association; served during the World War; aged 56; was found dead, June 8, of heart disease.

Justin Gideon Hayes, Williamsburg, Mass.; University of the City of New York Medical Department, 1881; member of the Massachusetts Medical Society; aged 86; died, June 18, in the Cooley Dickinson Hospital, Northampton.

Omer Hamilton McDonald, Remus, Mich.; Starling Medical College, Columbus, 1903; member of the Michigan State Medical Society; aged 66; died, June 12, in the Kelsey Hospital, Lakeview, of chronic myocarditis.

George Gove Kelly, Hingham, Mass.; Hahnemann Medical College and Hospital, Chicago, 1908; at one time on the staff of the Boston State Hospital; aged 62; died, June 27, in the Springfield (Mass.) Hospital.

George B. C. Elliott, Millvale, Pa.; Western Reserve University Medical Department, Cleveland, 1889; member of the Medical Society of the State of Pennsylvania; aged 72; died, June 22, of cerebral hemorrhage.

Humphrey H. Bate, Castalian Springs, Tenn.; University of Nashville Medical Department, 1897; member of the Tennessee State Medical Association; veteran of the Spanish-American War; aged 61; died, June 12.

Dudley Leavitt Stokes ✠ Rochester, N. H.; Dartmouth Medical School, Hanover, 1889; formerly city and county physician; at one time on the staff of the Frisbie Memorial Hospital; aged 70; died, June 25.

Victor Frank Carey, Downsville, La.; Tulane University of Louisiana Medical Department, New Orleans, 1910; member of the Louisiana State Medical Society; aged 50; died, June 24, in a hospital at Monroe.

Nathaniel Frutkow ✠ Chicago; University of Kansas School of Medicine, Kansas City, Kan., 1914; aged 46; member of the staff of the Henrotin Hospital, where he died, July 20, of streptococcic meningitis.

Hugh Edward Prather ✠ Hickman, Ky.; University of Louisville Medical Department, 1901; served during the World War; formerly county health officer; aged 58; died, June 1, of a ruptured gallbladder.

William Eugene Russell, Hico, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1900; aged 71; died, June 11, in a hospital at Waco, following an operation for intestinal obstruction.

Matthew E. McManes, Piqua, Ohio; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; aged 60; died suddenly, June 6, of cerebral hemorrhage.

Abel J. Sands ✠ Choctaw, Okla.; College of Physicians and Surgeons, Keokuk, Iowa, 1889; veteran of the Spanish American War; formerly member of the state legislature; aged 69; died, June 16.

Hugo Louis Heitefuss ✠ Wilmington, Del.; Long Island College Hospital, Brooklyn, 1928; on the staffs of St. Francis and Delaware hospitals; aged 32; died suddenly, June 29, of coronary thrombosis.

Robert F. Price, Terre Haute, Ind.; Medical College of Ohio, Cincinnati, 1886; member of the Indiana State Medical Association; aged 76; died, June 27, of coronary embolism and chronic myocarditis.

Gilbert Miller ✠ New York; University and Bellevue Hospital Medical College, 1908; on the staffs of the Lying-in Hospital and the Jewish Memorial Hospital; aged 49; died suddenly, June 3.

Albert Gustaf Lundgren, Mattapan, Mass.; Boston University School of Medicine, 1933; served during the World War; aged 44; died, June 28, in the Barnstable County Sanatorium, Pocasset.

Washington Pierce Glover, Atlanta, Ga.; Bellevue Hospital Medical College, New York, 1876; Civil War veteran; aged 83; died, June 20, of acute dilatation of the heart and arteriosclerosis.

Kathalyn Voorhis, Worcester, Mass.; Tufts College Medical School, Boston, 1916; member of the Massachusetts Medical Society; aged 50; died, June 19, in the Harvard Private Hospital.

Jacob Kendell, Covington, Ohio; Miami Medical College, Cincinnati, 1869; formerly bank president; for many years member of the school board and city council; aged 89; died, June 8.

Edmond Dawson Standly ✠ Brookfield, Mo.; University Medical College of Kansas City, 1897; served during the World War; aged 64; died, June 16, of carcinoma of the bladder.

J. H. Linzy, Comanche, Okla. (registered in Oklahoma by the state board of health, under the Act of 1908); member of the Oklahoma State Medical Association; aged 76; died in June.

Bernard Charles Kelly, Carroll, Iowa; Hahnemann Medical College and Hospital, Chicago, 1887; aged 75; on the staff of St. Anthony Hospital, where he died, June 11, of carcinoma.

John Franklin Cave, Kansas City, Mo.; Western Eclectic College of Medicine and Surgery, Kansas City, 1908; aged 63; died, June 21, of coronary embolism and chronic myocarditis.

William Bright March, San Jose, Calif.; Eclectic Medical Institute, Cincinnati, 1884; member of the California Medical Association; aged 76; died, June 23, of cerebral hemorrhage.

Frank John, McKeesport, Pa.; Eclectic Medical Institute, Cincinnati, 1882; Baltimore Medical College, 1894; aged 87; died, June 13, of arteriosclerosis and chronic myocarditis.

Ernest L. Griffith ✠ Clifton Forge, Va.; University of Maryland School of Medicine, Baltimore, 1907; served during the World War; aged 51; died suddenly, June 21.

William D. Lewis, Beckley, W. Va.; University of Louisville (Ky.) Medical Department, 1912; served during the World War; aged 49; died, June 10, in a local hospital.

Jacob La Porte ✠ Chicago; Illinois Medical College, Chicago, 1907; aged 55; died, August 22, in the Edgewater Hospital, of cerebral hemorrhage and hypertension.

Elmer E. Mosher, Greenwich, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1885; aged 75; died, June 24, of diabetes mellitus and acute nephritis.

Spencer P. McNairn, Burleson, Texas; Memphis (Tenn.) Hospital Medical College, 1899; member of the State Medical Association of Texas; aged 66; died, June 17.

Thomas Pollard Darracott, Tunstall, Va.; Medical College of Virginia, Richmond, 1885; member of the Medical Society of Virginia; aged 77; died, June 26.

Charles Melville Harrington, Chicago; Chicago Homeopathic Medical College, 1899; aged 64; died, August 17, of chronic nephritis and cerebral hemorrhage.

Orrin Philander Joslin, Carthage, N. Y.; University and Bellevue Hospital Medical College, New York, 1899; aged 59; died, June 11, of cerebral hemorrhage.

Arthur M. Ruhl ✠ Edmond, Okla.; Kansas City Homeopathic Medical College, 1900; aged 60; died, June 27, in a hospital at Oklahoma City, of pneumonia.

Charles Newton Gartin ✠ Chicago; Bennett Medical College, Chicago, 1912; aged 46; was drowned while swimming in Lake Michigan at Gary, Ind., June 14.

Daniel Lawrence Moore, Nahunta, Ga.; Atlanta Medical College, 1894; member of the Medical Association of Georgia; aged 62; died, June 23, of angina pectoris.

Granville Storey Ramsay, Collins, Miss.; Emory University School of Medicine, Atlanta, Ga., 1923; aged 37; died, May 27, in the Methodist Hospital, Hattiesburg.

Samuel Eikenborg Latta, Stockton, Calif.; Rush Medical College, Chicago, 1884; member of the California Medical Association; aged 74; died, June 13.

Moses I. DeVorkin, Los Angeles; (licensed in Missouri in 1891); formerly a practitioner in St. Louis; aged 73; died suddenly, June 6, of heart disease.

Robert Michael Hillary, Aurora, Ont., Canada; Trinity Medical College, Toronto, 1890; aged 73; died, June 1, in the Christie Street Hospital, Toronto.

John Ross Beiter ✠ Canton, Ohio; Western Reserve University Medical Department, Cleveland, 1907; aged 56; died, June 30, of coronary thrombosis.

Rollin Jones Goss, Wilder, Vt.; Baltimore Medical College, 1896; aged 65; died, June 26, of coronary thrombosis, arteriosclerosis and hypertension.

John B. Lichtenwallner, Omaha; University of Pennsylvania Department of Medicine, Philadelphia, 1882; aged 76; died, June 25, of chronic myocarditis.

Frank A. Stahl, ✠ Chicago; Rush Medical College, Chicago, 1887; at one time instructor in obstetrics at his alma mater; aged 73; died, June 10.

Thomas D. Miller, Aurora, Mo.; Missouri Medical College, St. Louis, 1898; aged 69; died, June 8, in St. Louis, of carcinoma of the stomach.

Charles McConnell, Hogansburg, N. Y.; University of the City of New York Medical Department, 1881; died, June 15, of coronary thrombosis.

Horace B. Dean, Horseheads, N. Y.; Hering Medical College, Chicago, 1910; aged 63; died, June 4, of cerebral hemorrhage and pneumonia.

Joseph Allen Graham, Long Beach, Calif.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1904; aged 58; died, June 18.

Franklin Eliada Way, Talmo, Kan.; Kansas City (Mo.) Medical College, 1895; aged 68; died, June 18, of arteriosclerosis and myocarditis.

Louis Montrose Coon, Denison, Iowa; St. Louis College of Physicians and Surgeons, 1898; aged 70; died, June 15, of myocarditis.

David Ellis Miller ✠ Monett, Mo.; Kentucky School of Medicine, Louisville, 1897; aged 69; died, June 23, of cerebral hemorrhage.

William M. Cawhern, Atlanta, Ga.; Atlanta College of Physicians and Surgeons, 1899; aged 69; died, June 24, of erysipelas.

Edwin E. Lamb, Ellwood City, Pa.; Cleveland University of Medicine and Surgery, 1897; aged 66; hanged himself, June 11.

Jacob Francis Hahn, Donnellson, Ill.; University of Illinois College of Medicine, Chicago, 1936; aged 31; died, June 13.

Thomas Riggs Steagall, Tacoma, Wash.; Kentucky School of Medicine, Louisville, 1897; aged 73; died suddenly, June 3.

Charles Leson Landfair, Bluffton, Ind. (licensed in Indiana in 1897); aged 71; died, June 11, of influenza and chronic cystitis.

Thomas F. Hudson, Houston, Texas; Louisville (Ky.) Medical College, 1894; aged 76; died, June 3, of cerebral hemorrhage.

Oscar Alcander Kennedy, Tremont, Miss.; Memphis (Tenn.) Hospital Medical College, 1894; aged 65; died, June 20.

George La Grange Coleman, San Leandro, Calif.; Cooper Medical College, San Francisco, 1903; aged 56; died, June 27.

Judson L. Lamb, Burbank, Calif.; University of Wooster Medical Department, Cleveland, 1880; aged 88; died, June 27.

John Isaac Allison, Bloomington Springs, Tenn. (licensed in Tennesse in 1889); aged 72; died, June 21, of nephritis.

Herman Lodowick Crary, Crown City, Ohio; Starling Medical College, Columbus, 1904; aged 58; died, June 10.

Hans P. Hanson, Beresford, S. D.; John A. Creighton Medical College, Omaha, 1896; aged 89; died in June.

Charles B. Hunt, New Castle, Pa.; Baltimore Medical College, 1891; aged 69; died, June 14, of embolism.

Albert Frank Allen, Los Angeles; College of Physicians and Surgeons, Chicago, 1885; aged 74; died, June 12.

Jean Sarah Hahl, Clarence, N. Y.; University of Buffalo School of Medicine, 1936; aged 23; died, June 1.

Leslie Alvey Beard, Polo, Ill.; Chicago Medical College, 1889; aged 76; died, June 26, of heart disease.

Correspondence

"POOLED CONVALESCENT HUMAN SERUM IN POLIOMYELITIS"

To the Editor:—It is the duty of every practicing physician to offer hope and comfort to the family of a patient who is ill with poliomyelitis. Your recent editorial (THE JOURNAL, August 8, p. 432) offers such consolation particularly with respect to serotherapy. Yet certain evidence obtained from recent epidemics makes the value of convalescent serum as a therapeutic measure in the acute stage of poliomyelitis extremely doubtful. One has only to recall that until recently serum was employed in the paralytic stage of poliomyelitis with apparent efficacy. More careful workers later were led to the opinion that certain indicators of the value of serum in cases of paralysis were unreliable, for paralyzed patients were usually past the acute stage of their disease. The drop in temperature or the apparent arrest of paralysis following the administration of serum was often seen also in patients who had received no serum.

The same uncertainty holds true in appraising serum used in the preparalytic, or what is termed the meningitic, stage of the disease. During the 1931 epidemic (Fischer, A. E.: Human Convalescent Serum in the Treatment of Preparalytic Poliomyelitis, *Am. J. Dis. Child.* **48**:481 [Sept.] 1934), although 477 cases were treated and over a hundred control cases were studied, no decision could be reached. It was definitely shown, however, that in many cases diagnosed in the meningitic stage and untreated, paralysis never occurred. Had the same patients received a serum, one would have been led to the conclusion that recovery was due to the treatment.

Another opportunity to study the question again presented itself last summer when an epidemic occurred in New York City. Of the 685 patients with poliomyelitis admitted to the Willard Parker Hospital, 282 had no paralysis on admission. Only fifty-seven of these 282, or 20 per cent, ever developed any paralysis and none of these died. There were, therefore, four chances in five that paralysis would not develop in a case seen in the "preparalytic" or meningitic phase. No serums or transfusions of any kind were employed. It was not possible to determine how many of the paralyzed patients had a "preparalytic" phase. Some of them no doubt did. All the deaths (eighteen) that occurred were of patients who were already paralyzed on admission to the hospital; in other words, those in whom the virus-nerve cell union had already taken place.

In the light of the experience of the 1935 epidemic, then, it can be said that if the diagnosis of the disease was made in the meningitic stage the case offered a good prognosis. A careful analysis of the available data in other recent outbreaks likewise bears out the same contention. In the 1934 California epidemic there were large numbers of preparalytic cases and consequently a low mortality (*Am. J. Pub. Health* **24**:1204 [Dec.] 1934). In Denmark in 1934 less than 20 per cent of the patients developed paralysis (Jensen, C.: The 1934 Epidemic of Poliomyelitis in Denmark: Preliminary Report of the Epidemiological and Clinical Features and Convalescent Serum Therapy, *Proc. Roy. Soc. Med.* **28**:1107 [June] 1935). The two epidemics were both mild, as evidenced by the low mortality. They were comparable in other respects (age distribution, communicability, and so on).

It may be argued that the foregoing statements hold only for convalescent serums and not for so-called normal pooled adult serums, which are said often to exceed convalescent serums in their ability to neutralize the virus of poliomyelitis. Unfortunately, the method used to test the virucidal substance in serum is a very crude one. Because of the many variables in the performance of the monkey serum neutralization test, one must accept with caution statements that certain serums are more potent than others. Indeed, one cannot even be certain that real "antibody," which may be of help in the human disease, is present in the circulating blood; for since serums from poliomyelitis convalescents often do not possess neutralizing power, may it not be that one is dealing with tissue immunity in that disease rather than humoral immunity? There is no evidence which justifies placing any therapeutic value on any serum in the treatment of poliomyelitis at the present time.

ALFRED E. FISCHER, M.D., New York.

MEASURING PRESSURE OF BILE DUCTS

To the Editor:—I was very much interested in the communication from Dr. Harry Koster and Dr. Arthur Shapiro in the August 1 issue of THE JOURNAL relative to the method they used in studying the pressure within the common bile duct. Our failure to read their article is attributable to the fact that it was hidden in their paper, which was entitled "On the Rate of Secretion of Bile."

In discussing with physicist Charles Sheard the question of intraductal pressure, I obtained permission to quote him as follows: "The intraductal pressure, as has been pointed out by Koster, Shapiro and Lerner, should include, in addition to the reading of the manometer attached to the T-tube, the equivalent vertical height from the point of entrance of the tube in the abdomen to the end of the common duct. In the report of the investigations on pressure in the common bile duct by McGowan, Butsch and Walters, it is definitely stated that all measurements of pressure were made from the abdominal wall. The data which they present are concerned with *changes* in pressures and, by reason of the omission of the equivalent pressure from the abdominal wall to the end of the duct, are not to be regarded as measurements of total pressure. Throughout the paper emphasis is laid on rise (or change) of pressure subsequent to the administration of certain drugs."

Dr. Sheard's statement should clarify the situation.

WALTMAN WALTERS, M.D., Rochester, Minn.

TREATMENT OF ACID BURNS OF THE EYE

To the Editor:—In THE JOURNAL, August 8, appeared a communication from Dr. W. D. Hubbard of Flint, Mich. He treats all acid burns with large quantities of water. In most instances I concur with this treatment as the first measure. However, there is one exception to this first treatment: in the case of concentrated sulfuric acid. This acid should be wiped off first, if possible, and then large quantities of water used. Concentrated sulfuric acid does not burn much until water is applied.

Caustics or alkalis burn the cornea of the eye, hair and horny tissues on contact, while the conjunctiva burns more slowly. The burning and penetrating action of the caustic or alkali leaves a layer of coagulated albumin above it. In experiments on guinea-pigs, I have found that water does not penetrate this coagulated albumin and hence does not neutralize nor dilute the caustic or alkali.

My work has shown that ammonium chloride in a 1 or 2 per cent solution neutralizes the caustic or alkali and does not produce heat in its chemical action because both are salts:

$$NaOH + NH_4Cl = NH_4OH + NaCl.$$

The ammonium chloride solution also penetrates the coagulated albumin and neutralizes the caustic or alkali within the tissues faster than anything else that I have tried.

Experimental work has shown also that the 1 or 2 per cent solution was as strong as I dared use in the eye, for stronger solutions produced exfoliation of the epithelium of the cornea. I flush the eye with a 1 per cent solution of ammonium chloride every fifteen minutes for two hours, then every half hour for three hours, and then every hour for twelve hours.

Since using ammonium chloride for caustic or alkali burns I have had few blind eyes. Under this care they clear up faster.

Of course, if this treatment is not started soon enough a great deal of destruction will have taken place, and after the neutralization the resulting ulcer must be treated in the usual way.

SHERWIN LIVINGSTON HASELTINE, M.D.,
Elizabeth, N. J.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MODERATE INDULGENCE IN ALCOHOL

To the Editor:—What is the best opinion today as to what constitutes temperate use of alcoholic beverages? What quantity of alcohol in the form of spirit or wines may be imbibed daily without deleterious effect by the average individual? How many ounces of alcohol can the average individual utilize daily as heat and energy? May it be assumed that the harmful effects result from the amounts taken above the utilization point? Please recommend a small readable textbook on the subject.

JOHN HOWELL WEST, M.D., Easton, Pa.

ANSWER.—Perhaps the best definition of what constitutes a temperate use of alcoholic beverages is the amount that can be taken by the individual without obvious deleterious effect. Because individuals differ so much to begin with, and because the amount of alcohol tolerated by the habituated person is so different from that which can be taken by the abstainer, it is impossible to say what can be taken safely by the average person. As every one knows, there are thousands of men and women who are made dizzy and uncomfortable by two cocktails, and then again there are persons who can drink a quart of whisky in an evening without showing any sign of alcoholism.

It is hard to say also how much alcohol the average person can safely utilize as food. As Mitchell has shown in his excellent analysis of this phase of the subject, the energy of alcohol is to a large extent available to the body. When added to a complete diet, alcohol induces a greater retention of nitrogen as well as of fat. As compared with a similar supplement of sugar, the energy of an alcoholic supplement is only about three-fourths as available, probably because of a greater specific dynamic effect. Its growth promoting power is definitely less than that of sugar. These conclusions were based on experiments on rats.

Careful studies of the absorption of alcohol and the rate of its disappearance from the blood are described in Mellanby's report to the Medical Research Committee of Great Britain. Because alcohol is excreted so slowly from the blood, the effects of repeated small doses are likely to be the same as those of one large dose. In order to avoid intoxication from repeated small doses, the interval between the drinks must be at least three hours. The effects on the brain of drinking much dilute alcohol can be the same as those of taking a small amount of the concentrated drug. The degree of intoxication seems to be related to the amount of alcohol in the blood and probably to its rate of accumulation in the body.

Water taken with alcohol was found to stimulate its absorption and to cause a more rapid and intense intoxication, but also a quicker recovery. Milk taken with alcohol seemed to be the most effective food in inhibiting intoxication.

It is not yet clear why some persons can tolerate more alcohol than others. Cushny quotes Pringsheim, who showed that part of the greater tolerance of the habituated person is due to an increased ability of the tissues to oxidize the drug. In addition the sensitiveness of the brain must be altered, because Sweisheimer found that a given concentration of alcohol in the blood induces greater intoxication in an abstainer than in a habitual drinker. Some students of the subject believe that the tolerant person absorbs less of the alcohol. It may be also that in tolerant persons the liver is able to handle a greater amount of the drug in a given time.

That the oxidative demands of the muscles play an important part in removing alcohol from the circulation was shown in the case of a physician whose boat capsized far out in an exceedingly cold lake. When he reached land, suffering terribly from the cold and shivering violently, friends wrapped him up and gave him a pint of whisky. To his surprise this man, who was practically an abstainer and always very sensitive to alcohol, experienced almost no psychic effect from the overdose of whisky. Apparently his quivering muscles utilized the stuff very rapidly.

Some discussion of individual differences in tolerance for alcohol is to be found beginning on page 263 of the excellent report by Miles on alcohol and human efficiency, based on a large amount of research work done in the Laboratory of Nutrition of the Carnegie Institution.

It can hardly be assumed that the harmful effects of alcohol result from amounts taken above the utilization point, because the studies of Miles and others show that even in small, easily oxidizable doses, alcohol depresses and interferes with mental efficiency. If in many persons it seems to increase efficiency and to stimulate, it is only because it removes inhibitions and anesthetizes to fatigue. Scientific students of the subject agree on this point.

It is hard to recommend a small readable textbook unless one knows whether the reader desires scientific information or material for sermons. A good example of a handbook for sermonizers is "A Syllabus in Alcohol Education" by Bertha Palmer, published by the National Women's Christian Temperance Union. There one learns among other things that "beer drinkers are apt to become the most un-human and beast-like of drink addicts." Beer makes its drinkers "filthy, lazy and shapeless." E. H. Williams' "Alcohol Hygiene and Legislation" published by the Goodhue Company is not quite so uplifting.

Unpalatable to uplifters but decidedly worth reading are Raymond Pearl's statistical proofs that the moderate use of alcohol does not shorten life. See the *American Mercury* **1**:213 (Feb.) 1924; also *International Clinics* **3**:27 (Sept.) 1928.

The following are references to the subject:

Williams, Edward Huntington: Alcohol Hygiene and Legislation, Goodhue Company, 1915.

Palmer, Bertha Rachel: A Syllabus in Alcohol Education, National Women's Christian Temperance Union, 1934, pp. 37-40.

Mellanby, Edward: Alcohol: Its Absorption into and Disappearance from the Blood under Different Conditions, Medical Research Council, Special Report Series, 31-36, report 31.

Mitchell, H. H.: Food Value of Ethyl Alcohol, *J. Nutrition* **10**: 311 (Sept.) 1935.

Miles, Walter R.: Alcohol and Human Efficiency: Experiments with Moderate Quantities and Dilute Solution of Ethyl Alcohol on Human Subjects, Publication 333, Carnegie Institution of Washington **3**: 265, 275 (March) 1924.

Cushny, Arthur F.: A Text-Book of Pharmacology and Therapeutics, ed. 10, revised by C. W. Edmunds and J. A. Gunn, Philadelphia, Lea & Febiger, 1934, Alcohol, pp. 184-209.

Pearl, Raymond: Alcohol and the Duration of Life, *Am. Mercury* **1**: 213 (Feb.) 1924.

Pearl, Raymond: Alcohol and Life Duration, *Internat. Clin.* **3**: 27 (Sept.) 1928.

Emerson, Haven: Alcohol: Its Effects on Man, New York and London, D. Appleton-Century Company, 1934.

Bogen, Emil, and Hisey, L. W. S.: What About Alcohol? Los Angeles, Angelus Press, 1934.

PSORIASIS

To the Editor:—I have a stubborn case of psoriasis. The patient strenuously objects to ointments. Is there any medication for subcutaneous, intramuscular or intravenous use that can give this man relief? What is the latest treatment? Please omit name.

M.D., Pennsylvania.

ANSWER.—Various agents and methods apart from local treatment of the lesions have been used in the management of psoriasis. In most instances these agents are used in addition to local treatment, although relief may sometimes be obtained without the aid of local therapy.

The use of salicin 1 Gm. in 1 ounce (30 cc.) of peppermint water three times daily, calcium with or without vitamin D, and thyroid by mouth is of value. The restriction of protein and of fat in the diet is also recommended. The subcutaneous injection of sodium cacodylate or the intramuscular injection of 10 cc. of blood (autohemotherapy) every five to seven days may clear up the lesions. The intramuscular injection of suspension of the patient's own scales, finely ground, in alcohol, in a dose of from 1 to 4 cc. at three or four day intervals, has been employed by Campbell and Frost (*Arch. Dermat. & Syph.* **22**:685 [Oct.] 1930). The emulsion consists approximately of 0.2 Gm. of psoriatic scales in 20 cc. of pure alcohol. Sodium salicylate, by intravenous injection, in a 20 per cent sterile

solution at two or three day intervals, the dose then gradually increased from 0.5 to 3 Gm., may be employed. Typhoid vaccine intravenously to produce a moderate fever reaction is also effective in some cases. Roentgen irradiation of the thymus has been used with favorable results in a group of cases treated by O. H. and H. R. Foerster (*Arch. Dermat. & Syph.* **4**:639 [Nov.] 1921). The use of sodium thiosulfate, intravenously, from 0.3 to 1 Gm., dissolved in 10 cc. of water, given at three to seven day intervals, is also of value. General ultraviolet exposures are of particular value in the cases in which there are summer remissions.

All these methods have been employed with variable results in psoriasis. Because of the capricious response of this disease to treatment it is difficult to make a definite recommendation regarding any single agent. The general condition of the patient, and one's experience with, and the availability of, a special agent used in treatment should dictate its choice. On the whole, conservatism in therapy in a disease that tends to recur is the procedure of choice.

VASOMOTOR INDEX OF EXTREMITIES

To the Editor:—I would appreciate your informing me of the technic in determining the vasomotor index of the extremities. We have an electrical thermometer and I have been baring the patient's extremities to the room air for thirty minutes and then recording the temperatures of each toe (solar surface) of both feet and next in order the sole, dorsum, internal malleolus, external malleolus, midleg internally and midleg externally of each extremity. The oral temperature and the room temperature are then recorded. The eleven points recorded on the right and on the left are then averaged for later comparison, after the intravenous injection of typhoid vaccine has been given and the patient has reached the maximal degree of oral temperature response. The legs are again bared for thirty minutes and the same procedure is carried out as before. This procedure was adopted empirically, as I have never had definite instructions. What about the points I have selected to make temperature takings and getting the average for my calculation? What about the necessary preparations before beginning, such as baring the legs? Please give the formula for the vasomotor index and what the normal index should be. Finally also inform me what allowance to make for difference in room temperature.

GEORGE W. SHRIVER, M.D., Charleston, W. Va.

ANSWER.—The ideal circumstances for determination of the vasomotor index are as follows: All medication and treatment that might influence the temperature of the skin should be discontinued the day before the test. The patient should have no fever. Smoking is prohibited. The patient should be at rest in the recumbent position in a quiet environment. The room temperature should be constant at about 72 F. and the extremities should be protected from drafts of air by a sheet placed over a cradle. The end of the compartment thus made should be open at the end near the foot of the bed.

A thermocouple junction is fixed with adhesive tape to the pulp of the distal phalanx of each of two or more digits of each extremity to be studied. Temperatures are determined every ten or fifteen minutes until they are fairly constant. Fever is then induced artificially by the intravenous injection of typhoid vaccine. For the purposes of this test a fever of from 101 to 102 F. is superior to higher temperatures. Temperatures of the skin and mouth are determined every thirty minutes until the mouth temperature is maximum. The maximum increase in the skin temperature of a particular digit minus the increase in mouth temperature at that time gives a figure which, when divided by the increase in the mouth temperature used in the first calculation, is the vasomotor index for that digit, or the increase in skin temperature due to vasodilatation for each degree of increase in the mouth temperature. It is not necessary from a clinical standpoint to determine the temperature of points other than those indicated. It is fallacious to use the mean of the increases in temperatures of various digits. Available vasodilatation for each individual digit should be determined by the test, and this is overlooked when an average of all the increases in skin temperature is used. There is no exact normal vasomotor index; in any specific instance it should exceed 2 degrees if fitness of the patient for sympathectomy is accepted. It is assumed that the correspondent's use of the vasomotor index is for determining available vasodilatation. Other information is important, such as the maximum temperature of the digits and the increase in their temperature as a consequence of fever. All three results of the study should be considered together.

Less ideal circumstances for determination of the vasomotor index are fluctuating room temperature and a noisy environment; both interfere with near basal determinations. Increasing or decreasing temperatures of the room cause an increase and a decrease, respectively, in the temperature of the skin of the digits. Argument and excitement likewise influence the temperature of the skin of the extremities.

MECHANISM OF LEUKOCYTOSIS

To the Editor:—1. When a drug or any other substance, when injected intravenously, incites a leukocytosis, does this leukocytosis result in an immunity producing reaction or coincide with such a healing effect? Or is this only an artificial effect that not necessarily produces healing? 2. When the injection of a substance intravenously incites a leukocytosis is there always, or as a rule, a period of leukopenia followed by an increase in the number of leukocytes? How long will the period of increased number of leukocytes persist? Or is this period subject to a considerable variation according to the substance or substances injected? 3. When a leukocytosis is induced in this way is there a decrease in the number of degenerative forms in the peripheral neutrophils so that there is a corresponding decrease in Rosenthal's degeneration index? Is this effect lasting? 4. Is the leukocytosis that is induced subject to repeated inductions so that daily or other frequent intravenous injections may be given until a high degree of leukocytosis is obtained or maintained? 5. Meranze, Mendell and Meranze (*Am. J. M. Sc.* **189**: 639 [May] 1935) mention their use of a Jenner-Giemsa stain during their study of the degenerating forms of the peripheral neutrophils. Is this stain superior to the much used Wright's stain to demonstrate the cytoplasmic changes? In what way? Will you please give me the technic in the use of this stain and the formula, if it is different from the Giemsa stain? 6. When it is desired to give sodium nucleinate intramuscular injections to induce leukocytosis, what dosage and strength of solution are given? How often? Is any distressing reaction incited by this solution? Please do not publish name or address.

M.D., Montana.

ANSWER.—1. The leukocytosis of neutrophilic type produced by intravenous injections provides a true increased delivery of these elements from the bone marrow, and if the functional need for these cells exists a more effective defense reaction should result. The cellular reaction is, of course, no measure of humoral immunity and may occur quite independently.

2. A transitory leukopenia frequently precedes the leukocytosis, regardless of the nature of the material injected. According to the experiments of Doan, Zerfas, Warren and Ames (*J. Exper. Med.* **47**: 403 [March] 1928) this is due to an injury to the circulating granulocytes, which then sequester in the splenic parenchyma. Removal of the spleen decreases the degree and duration of the leukopenic period in rabbits. The degree and duration of leukocytosis vary markedly with the substance and dosage administered. It has been observed to persist for seventy-two hours or longer in rabbits after 1 Gm. of sodium nucleinate or after 50,000,000 killed typhoid organisms, the high point (frequently 100,000) being reached at the end of twenty-four hours.

3. A leukocytosis, however induced, may be shown to reflect the bone marrow delivery of new cells through the "shift to the left" in the Arneth-Schilling index, which always occurs and persists until after an equilibrium has again been reestablished.

4. Nucleotide has been injected daily over a period as long as 116 days in rabbits with a maintained elevation in the leukocyte level throughout the observation with marked generalized marrow hyperplasia and the development of ectopic myeloid foci in kidney and spleen (Doan, C. A.: The Neutropenic State, THE JOURNAL, July 16, 1932, p. 194). The mesenchymal tissues must have the ability to respond to stimuli, of course, in order to elicit a granulocytosis. In some clinical states, toxic or other inhibitory or destructive agents may neutralize both natural and introduced stimuli or render them ineffective.

5. The Giemsa counterstain used in conjunction with the Jenner or Wright blood stain is important in more sharply emphasizing differences in the degree of basophilia in the cytoplasm of all white blood cells. The degree of cytoplasmic basophilia is one measure of the youth of the cells in both granulocyte and lymphocyte series, and important interpretations may be based on this criterion when taken in conjunction with the character and number of granules (toxic granulations), nuclear chromatin changes, and vacuolization. Carry out the usual Wright's staining technic, then dilute the saturated solution Giemsa stain 15 drops in 10 cc. of distilled water and float the cover slip upside down in a watch glass containing the stain for six minutes; wash, dry and mount.

6. Sodium nucleinate may be given in 0.5 to 1 Gm. doses in sterile distilled water, 10 cc. intramuscularly. Adenine nucleotide may be given in comparable dosage. The pentnucleotides are prepared and available in sterile ampules, 0.7 Gm. in 10 cc. solution (Smith, Klein and French, Philadelphia) for intramuscular use. In properly selected and diagnosed patients, if the patient is acutely ill, this dosage should be administered every eight hours, until the granulocytes are well represented in the peripheral blood again. Such dosage may be further diluted in 50 cc. of sterile saline solution and given slowly into the vein (from twenty-five to thirty minutes for 50 cc.). Alternate intramuscular and intravenous medication every eight hours is sometimes desirable. Usually no constitutional or local reaction is noted. Rarely dyspnea and substernal pain may occur from twenty to thirty minutes following the injection. No serious or fatal reactions have been reported.

NEUROLOGIC COMPLICATIONS OF DIABETES

To the Editor:—A woman, aged 60, was suffering from diabetes for two years. She treated herself for quite a while with some quack medicine, which apparently consisted of a kind of yeast. She saw a physician five or six months ago who gave her insulin and prescribed a diabetic diet in rather general terms. The diabetes was not controlled and the patient was living mainly on cabbage and other vegetables. She came under my care by the beginning of last June. Her heart was decompensated. She had an aortic-systolic murmur, aortic configuration of the heart, some broadening and density of the aorta and an aortic knob. The pulse was 96, the blood pressure 190 systolic, 90 diastolic. The specific gravity of the urine varied from 1.012 to 1.018; albumin was 0.5 per cent, sugar +++, and acetone present. The blood sugar was 300, the urea nitrogen 27. She complained about some pain in both legs and weakness of the knees. The diet was adjusted. She is now getting 1,850 calories, 25 per cent above maintenance. The urine is free of sugar and acetone but still contains albumin. The last blood sugar was 176, urea nitrogen 15, carbon dioxide combining power 53 volumes per cent. The pulse rate is 78, the blood pressure is 160/90, and the heart is compensated. In short, diabetic, heart and kidney conditions are under control. There is, however, an increasing weakness of the legs with torturing cramps and pains particularly during the night. The circulation in the legs is sufficient. The patellar and ankle jerks are abolished and the flexors of the legs markedly weakened. The Babinski reflex is negative. Romberg's sign is present. There is impairment of the sense of vibration. The gait is ataxic. A neurologist agrees with me that all the symptoms of a subacute combined degeneration are present. There are no signs of pernicious anemia, however. Acidity after test breakfast was: free hydrochloric acid, 32; combined, 12; total, 82. Blood examination revealed 4,500,000 red cells without pathologic forms; hemoglobin, 80 per cent; color index, 0.9; leukocytes, 10,000, with a slight shift to the left; monocytes, 6 per cent; eosinophils, 6 per cent; basophils, 2 per cent. The patient has a slight cystitis, which may account for the white blood picture. She is getting 50 units of insulin, digitalis in maintenance doses, a preparation of vitamins A, B and D to combat any deficiency, and sedatives. Diathermy helped a little but could not be continued, as the patient left the hospital. How can one explain the changes in the cord? The patient claims that her pain started when she was put on insulin. Are insulin reactions of this kind possible? What can be done for the improvement of her condition? Please omit name.

M.D., New York.

ANSWER.—Insulin prevents rather than causes neurologic complications in the course of diabetes, if it is used with discretion. In the differential diagnosis of this case, must one not consider a diabetic neuritis as possible? Surely one would like to exclude any circulatory deficiency in the extremities with the use of the oscillometer, prove that hypoglycemia is absent, and investigate the possibility of syphilis of the central nervous system or a tumor of the spinal cord.

While constantly alert for new evidence as to etiology, treatment would proceed on the basis of neuritis as responsible in whole or in part for most of the symptoms. The indication therefore would be to treat the diabetes energetically, being sure to take pains that hypoglycemia is avoided and that, on the other hand, a liberal supply of food is furnished. The diet would contain fruit and vegetables in abundance, yeast concentrate or some other source of vitamin B, cod liver oil on the ground that possibly more vitamins are indicated than have been furnished, and, despite the result of the blood examination, one might even use liver extract with benefit. Finally, physical therapy might be employed, depending chiefly on heat and using exercise with caution. Fractures of the spine and tumors of the spinal cord are rare complications in diabetes; the commoner complication is neuritis.

EFFECTS OF EXERCISE ON BLOOD PRESSURE

To the Editor:—What is the normal effect of exercise on the diastolic and systolic blood pressure? Please omit name.

M.D., Michigan.

ANSWER.—The normal effects of exercise on the arterial tension vary with the type, duration and intensity of the exertion. Brief and moderate exertion, such as climbing a short flight of steps slowly or bending to the floor from twelve to fifteen times, causes a rise in both the systolic and the diastolic tension and an acceleration of the cardiac rate. The rise is about 10 to 20 mm. systolic and 5 to 10 mm. diastolic, with considerable variation in either direction. In normal individuals the pulse and blood pressure return to preexertion levels well within two minutes. This type of response is used as a criterion of circulatory fitness, but the interpretation must include consideration of other factors such as the muscular condition of the patient, the age and the emotional state. Thomas Addis (Blood Pressure and Pulse Rate Reactions, *Arch. Int. Med.* **30**:240 [Aug.] 1922) studied the circulatory responses to exertion of 300 normal persons and found that the increase in both pulse rate and pulse pressure varied directly with the amount of work. The rise of the systolic tension is greater than that of the diastolic, with an increase in the cardiac output and therefore an elevated pulse pressure. In this normal circulatory response the pulse acceleration and deceleration are both more prompt than the changes in the arterial tension; the latter lags behind both in rising and in falling with rest. Exhausting, violent and excessive exertion may result in a fall in the diastolic level, which may be followed by depression of the systolic pressure if the heart has been overtaxed and collapse impends.

It has been shown (Scott, V. T.: Study of Effects of Daily Exercise on Pulse and Arterial Pressure, *Mil. Surgeon* **55**: 334 [Sept.] 1924) that the institution of regular exercise in poorly trained persons, such as military drilling with new recruits, results in a gradual fall in the diastolic pressure, but that there is no essential variation in the systolic tension.

The arterial tension is so labile and is affected by so many variables, such as emotional stresses, environmental temperature, digestion and mental activity (mental work in contrast to emotional activity), that one must be very cautious in interpreting the significance of moderate fluctuations.

DIFFERENTIAL DIAGNOSIS OF ABDOMINAL PAIN

To the Editor:—A man, aged 40, weight 165 pounds (75 Kg.), height 5 feet 9 inches (175 cm.), has been admitted to the hospital twice for severe attacks of epigastric pain and nausea. The pain was localized 1 or 2 inches above the umbilicus, with some radiation to the right. Rigidity was present during these attacks, which lasted about twelve hours with subsidence in one or two days. Two years previously the patient had symptoms and signs suggestive of acute appendicitis but the appendix on removal proved to be normal both grossly and microscopically. The patient continues to complain of a constant mild deep seated tenderness about 2 inches above McBurney's point. Mild tenderness in the localized area just above the umbilicus persists. During one of the acute attacks the patient's temperature remained around 101 F. for eighteen hours. The leukocyte count was 13,000 and the systolic blood pressure dropped about 15 mm. The rest of the physical examination and history is not significant. Laboratory examinations included the following: The Graham Cole test was negative. A flat plate of the abdomen during one of these attacks showed a small amount of gas in the small bowel loop suggestive of stasis. The stomach and duodenum were normal under the fluoroscope. An intravenous pyelogram was negative. Roentograms of the long bones and skull were negative. Urinalysis and blood smears were repeatedly negative. A differential blood count was repeatedly normal. An electrocardiogram taken after one of these acute attacks showed only a moderate left axis deviation. Blood and spinal fluid Wassermann reactions and colloidal gold curves are negative. Blood urea, erythrocyte sedimentation rate and dextrose tolerance curves are normal. Blood phosphorus (serum) determinations gave values of 4.4 and 4.2 mg. per hundred cubic centimeters. Five determinations of the blood calcium gave values ranging from 12 to 15 mg. per hundred cubic centimeters. Quantitative determination of plasma proteins gave the following values: fibrinogen, 0.4 Gm. per 10,000 plasma; globulin, 2 Gm. per 10,000 plasma. albumin, 4.8 Gm. per 10,000 plasma; total, 7.2 Gm. per 10,000 plasma. Kidney dilution concentration and phenolsulfonphthalein tests gave normal results. The bromsulfalein liver function test showed no dye present after half an hour (normal response). On a diet of 0.5 Gm. of calcium daily the average daily calcium excretion was 0.31 Gm. This was about twice that excreted by a control convalescent herniotomy patient of the same age and approximately same type of stature and physical condition. The blood cholesterol was 240 and 290 mg. per hundred cubic centimeters on two separate determinations. The basal metabolism was —1. Serum bilirubin determinations gave values of 0.23 and 0.28 mg. per hundred cubic centimeters. Any suggestions or references to the literature will be appreciated.

INTERN, Minnesota.

ANSWER.—Several conditions suggest themselves, some of which are apparently ruled out. It is fairly well assured that, in the continued absence of red blood corpuscles in the urine, renal calculus is ruled out, and by the pyelogram that ureteral obstruction does not exist. This however is not absolute, and further examination of the urine passed immediately after an attack is advisable, especially in view of the high blood calcium. Marked tenderness in the right upper quadrant can speak for biliary tract disease, especially in the presence of the temperature elevation and leukocytosis. It may be possible to obtain a plate during one of these attacks taken with low milliamperage and a long exposure that will show a distended gallbladder. Allergic disease of the gallbladder must be considered seriously. An inquiry into a family history of allergy is obtained in half or more of all cases. Other disturbances, as urticaria, canker sores and intermittent bowel distress or diarrhea, should be looked for. It is much more difficult to prove the possibility of pancreatitis. Recent reports in the literature point to the increased frequency of this condition with or without pancreatic calculi. Occasionally a glycosuria may occur. The blood sugar need not be elevated. There need be no evidences of biliary tract involvement. An enlarged duodenal loop, visualized with a barium sulfate meal, is suggestive of enlargement of the head of the pancreas. In the presence of a negative dextrose tolerance test the probability of pancreatic involvement is lessened but not entirely absent. A final suggestion is that of the possibility of terminal ileitis. While not probable from the

data submitted, its presence can be determined by watching the progress of a barium sulfate meal at three, six and nine hour intervals and noting the caliber and the regularity of the wall of the terminal ileum.

DEATH FROM SULFUR DIOXIDE

To the Editor:—I am interested in finding the cause of death in a person exposed to sulfur dioxide. In a book by Henderson and Haggard entitled "Noxious Gases and the Principles of Respiration Influencing Their Action," page 120, it is stated that "consequently it frequently happens that a man who appears to be only slightly affected is allowed, or told, to make some movement, such as sitting up in bed so that a physician may listen to râles in his lungs, and as the result of this slight exertion he falls back dead." Please explain to me the exact pathology and the cause of death suggested in this statement. I do not have access to this book at the present time. When sulfur dioxide is breathed, I understand that the local effect is due to the irritating action of sulfuric and sulfurous acids and that these acids do not cause any general systemic effect. I understand further that the salts of these acids, sulfates and sulfites, are absorbed into the blood stream and do cause a general systemic effect which may prove fatal by means of paralyzing certain nerve centers (H. Kionka experimenting on frogs with sulfur dioxide, as reported by Mellor in 1930). The use of sulfates as a food preservative is now illegal. Why? Please omit name.

M.D., New York.

ANSWER.—The quotation from Henderson and Haggard's book is taken from a paragraph which reads as follows: "As the edema progresses, the diffusion of carbon dioxide is interfered with to an increasing extent. The pressure of carbon dioxide in the arterial blood rises, probably the blood alkali also decreases, while anoxemia becomes more and more intense, and all three conditions contribute to the intense air hunger. The more marked symptoms depend upon the excessive pressure of carbon dioxide in the arterial blood, but the more serious damage results from the deficiency of oxygen. The asphyxia of lung edema arising from irritant gases, therefore, is more dangerous than the superficial signs indicate. Consequently it frequently happens that a man who appears to be only slightly affected is allowed, or told, to make some movement, such as sitting up in bed so that a physician may listen to the râles in his lungs, and as the result of this slight exertion he falls back dead. This is probably the failure of an overworked and asphyxiated heart." It seems reasonable to accept the last statement in this quotation as adequate explanation of the cause of death under the circumstances.

An objection to the use of sulfites (not sulfates) for a food preservative, especially meat products, seems to be that, owing to the fresh color thus given meat products, various forms of adulteration may be favored.

PARESTHESIAS

To the Editor:—Would you kindly suggest the diagnostic possibilities in the following case? A man, aged 40, previously healthy and not addicted to alcohol, and with no history of contact with lead or other toxic metals, noticed ten days ago that his feet felt as though his shoes were filled with sand; a couple of days later he noticed a numb feeling, which has gradually spread upward from the feet, the upper limits remaining stationary now for several days to the groin in front and about to the level of the first or second lumbar spine behind. In addition to this feeling of numbness he has the sensation of his socks being crumpled up and a certain amount of subjective stiffness in the knees. There is no pain and no objective sensory loss whatever, and he continues his work as a blacksmith without trouble. The reflexes are normal; there is no ataxia and no weakness. The blood picture is normal and the Kahn reaction is negative. He is decidedly not the neurotic or hysterical type of individual.

J. B. STOLL, M.D., Clay Center, Kan.

ANSWER.—From the history, the man has paresthesias of both lower extremities consisting of tingling, numbness and sensations of heaviness. There are two systems, when affected, which may cause such paresthesias. One is the peripheral vascular system and the other is the nervous system, especially the roots and peripheral nerves of the lumbosacral region (in this case). It is suggested that vascular disease be ruled out by palpation of dorsalis pedis and popliteal pulsations, that histamine be injected intracutaneously for the development of a wheal, and that postural studies be made with the extremities hanging in the dependent position and then elevated to the recumbent position. It is further suggested that the patient be reexamined daily for new signs and symptoms indicating involvement of the peripheral nerves, roots or spinal cord. A careful manometric and serologic study of the spinal fluid should be made in order to rule out spinal block. It is impossible to give any definite opinion as to what actual entity is causing the symptoms from the description. There are many diseases that may cause this symptom complex and until more signs and symptoms develop one will not be able to make a definite conclusion. At times paresthesias of this kind may disappear just as insidiously as they came on. When paresthesias are confined to the external lateral surface of the thighs the condition is known as meralgia paraesthetica. It is possible that this patient may have a subacute atypical arthritis of both knees.

POSSIBLE INFECTION FROM POORLY LAUNDERED LINENS

To the Editor:—Referring to the interesting paper "Scabies Among the Well-to-Do" (THE JOURNAL, February 29), by Dr. J. H. Stokes, I would be glad if the following considerations would find a place in one of your next editions: An important rôle in the dangers of hotel and traveling life in this country is played by the general habit or, better said, by the general neglect not to boil used bed linen and towels in industrial laundries as well as in private homes. That is done as a routine "on the other side" but not in the elsewhere so far advanced hygienic United States of America. Here linen is never boiled, only washed and ironed. The consequence is reinfestation of the traveling public by apparently clean bed linen and towels, as Dr. Stokes proved in his paper. I think it would be a good job for the profession or for public health authorities to exercise some pressure on the laundry industry and some influence on the general public always to boil used linen for a sufficient time before ironing it. Plain washing, even with addition of some disinfecting lotions and ironing, will never give sure protection against later contamination with some transmissible infection.

LEOPOLD SCHWARZ, M.D., Richfield Springs, N. Y.

ANSWER.—In general there are wide differences in laundering, ranging from the use of the mangle on linens without washing to the use of disinfectants so destructive, temperatures and washing methods so high and vigorous that the life of the linens, to say nothing of any possible contained parasites, is materially shortened. The elevation of linens in the process of washing to the boiling temperature in the presence of a mild alkali would be a desirable universal practice. It is probable that the fungi alone which survive less thoroughgoing laundry handling are responsible for the transmission of fungous infections. We know of no systematic study that covers this point. As far as the acarus of scabies is concerned, the adult would not survive laundering in the ordinary steam laundry washer plus the hot mangle. It seems probable that the blanket is responsible for more trouble than the linen. A laundry in Philadelphia has recently circularized the physicians of the city with an abstract from a study of the bacteriology of pillows which suggests that they can become accumulating grounds for pyogens of various types. Clothing made of silk or wool which is brought into direct contact with the skins of susceptible persons can apparently carry pyogenic infections. This is an element of some importance in acnes of the back, shoulders and chest in young women and in athletes ("sweater acne").

It might be that bed linen not subjected to boiling might serve as a source of occasional infection of susceptible persons with pyogenic organisms. Here again, however, a more systematic investigation would be needed as a basis for any recommendations.

MAZOPLASIA OF BREAST

To the Editor:—I have a puzzling case that has been diagnosed by a number of specialists in pathology and tissue diseases. No diagnosis pointed to cancer, but various names were given as a diagnosis; the latest was chronic periductal mammary fibrosis. In short, the history duration is approximately three years, beginning with pain in the breasts in a woman, aged 38. The menstrual history is negative, with the significant fact that for one or two days during the periods the pain in the breasts becomes less severe. In the last five years both breasts have enlarged and become firm, with a diffuse thickening with no palpable tumor masses. There are a few slightly thickened and enlarged nodes in the left axilla. In the last six months the pain in the breasts has been almost constant. There was some serous discharge from the nipples, but lately there has been no discharge whatever. Roentgen examination shows no tumor masses. The blood sugar is normal and Wassermann tests are constantly 3 plus with extensive antisyphilitic therapy. The pain in the breasts has continued despite the antisyphilitic treatments. The patent's weight has remained constant, and physical examination and pelvic examination are entirely normal. Can you give me any clues as to treatment for the relief of discomfort and what the future for the patient may contain? Please omit name.

M.D., New York.

ANSWER.—The patient is probably suffering from mazoplasia. This is a condition in which there is a hyperplasia of the connective tissue and epithelium of the mammary glands and represents an overactivity of these elements when normally they should be at rest. This condition is undoubtedly related to some disturbance in endocrine function, the exact nature of which is not fully understood. In some cases, particularly those in which there is a short and scanty menstrual period, the administration of one of the estrogens, either by mouth or preferably by hypodermic injection, may lead to relief of pain.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 29-July 1. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, Oct. 6-7. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Nov. 2. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, Nov. 10. Sec., Dr. A. S. Buchanan, Prescott. *Medical (Eclectic).* Little Rock, Nov. 10. Sec., Dr. Clarence H. Young, 207½ Main St., Little Rock.

CALIFORNIA: Sacramento, Oct. 19-22. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 6. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 10. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven. *Medical.* Hartford, Nov. 10-11. *Endorsement.* Hartford, Nov. 24. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Dover, July 13-15. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA: Washington, Jan. 11-12. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: Jacksonville, Nov. 16-17. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

GEORGIA: Atlanta, Oct. 13. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, Oct. 12-15. Sec., Dr. James A. Morgan, 48 Alexander Young Bldg., Honolulu.

IDAHO: Boise, Oct. 6. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 205 State House, Boise.

ILLINOIS: Chicago, Oct. 20-22. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

IOWA: *Basic Science.* Des Moines, Oct. 13. Sec., Prof. Edward A. Benbrook, Iowa State College, Ames.

KENTUCKY: Louisville, Dec. 2-4. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

LOUISIANA: New Orleans, December. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, Nov. 3-4. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, Dec. 8. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 8-9. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, Nov. 17-19. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Lansing, Oct. 14-16. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 6-7. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Oct. 20-22. Sec., Dr. Julian F. DuBois, 350 St. Peter St., St. Paul.

MISSOURI: Kansas City, Oct. 21-23. State Health Commissioner, Dr. E. T. McGaugh, State Capitol Bldg., Jefferson City.

MONTANA: Helena, Oct. 6. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 6-7. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW JERSEY: Trenton, Oct. 20-21. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 12-13. Sec., Dr. Le Grand Ward, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, Sept. 21-24. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: *Endorsement.* Raleigh, Nov. 30. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: Oklahoma City, Dec. 9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science.* Portland, Nov. 21. Sec., Mr. Charles D. Byrne, University of Oregon, Eugene. *Medical.* Portland, Jan. 5-7. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

RHODE ISLAND: Providence, Oct. 1-2. Chief, Division of Examiners, Mr. Robert D. Wholey, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, Nov. 10. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, Jan. 19-20. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

TENNESSEE: Memphis, Sept. 29-30. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

TEXAS: Waco, Nov. 10-12. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, Feb. 10-12. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, Dec. 9-13. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WEST VIRGINIA: Wheeling, Oct. 12-14. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

WISCONSIN: *Basic Science.* Madison, Sept. 26. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Madison, Jan. 12-14. Sec., Dr. Cornelius H. Cremer, Cashton.

WYOMING: Cheyenne, Oct. 5. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

SPECIAL BOARDS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, June. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written* examination will be held simultaneously in different centers of the United States and Canada in December. *Practical* or *clinical* examination will be given in St. Louis in April. Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Des Moines.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B candidates will be held in various cities in the United States and Canada, Nov. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: New York, Sept. 26. Sec., Dr. John Green, 3720 Washington Blvd., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Cleveland, Jan. 9. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, Sept. 25-26. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: San Francisco, Oct. 22-24. Baltimore and Cincinnati in November. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 29-30. Application must be sent to the Secretary before Oct. 30. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Cleveland, Sept. 25-27. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Chicago, Dec. 4-6. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Maine July Examination

Dr. Adam P. Leighton, secretary, Maine Board of Registration of Medicine, reports the written examination held in Augusta, July 7-8, 1936. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-six candidates were examined, all of whom passed. Two physicians were licensed by reciprocity after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Louisville School of Medicine		(1897)	77.2
University of Maryland School of Medicine and College of Physicians and Surgeons		(1936)	84
Boston University School of Medicine		(1936)	82
Harvard University Medical School		(1915) (1933) 83, (1934) 81, (1935) 80, (1936) 81	80,
Tufts College Medical School		(1934) 86, (1935) 76, 82.5, (1936) 77.4, 82, 83, 83.3	77,
University of Michigan Homeopathic Medical School		(1917)	78
Columbia Univ. College of Physicians and Surgeons		(1919)	75.3
Long Island College of Medicine		(1935)	83
Hahnemann Medical Col. and Hosp. of Philadelphia		(1935)	82
McGill University Faculty of Medicine		(1935) 87, (1936) 82	84,
University of Montreal Faculty of Medicine		(1936)	81
University of Dublin School of Physic, Trinity College		(1935)	88
Université de Genève Faculté de Médecine		(1935)	80*

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School		(1935)	Illinois
Medical College of Virginia		(1924)	Virginia

* Verification of graduation in process.

Virginia June Examination

Dr. J. W. Preston, secretary, Virginia State Board of Medical Examiners, reports the written examination held in Richmond, June 18-20, 1936. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. One hundred and three candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Howard University College of Medicine	(1935)	80, 80, 81,	83
Harvard University Medical School		(1935)	85
Jefferson Medical College of Philadelphia		(1936)	85
Medical College of Virginia		(1931) (1936) 79, 79, 80, 81, 81, 81, 82, 82, 82, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 88, 88, 88, 88, 88, 89.	82,
University of Virginia Department of Medicine		(1935) (1936) 75, 76, 76, 77, 78, 78, 78, 79, 79, 79, 80, 80, 80, 80, 81, 81, 82, 82, 82, 82, 82, 82, 83, 83, 84, 85, 85, 85, 85, 85, 86, 86, 86, 86, 86, 86, 86, 87, 87, 87, 87, 88, 88, 88, 90	77,
University of Toronto Faculty of Medicine		(1934)	80
Universität Leipzig Medizinische Fakultät		(1934)	86*

Seventeen physicians were licensed by reciprocity and 5 physicians were licensed by endorsement from January 6 through August 6. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine		(1927), (1932) District of Columbia	
Emory University School of Medicine		(1929), (1934)	Georgia
Indiana University School of Medicine		(1935)	Indiana

State University of Iowa College of Medicine	(1930)	Iowa
University of Louisville Medical Department	(1920)	Kentucky
Tulane University of Louisiana School of Medicine	(1935)	Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons	(1928)	W. Virginia
Harvard University Medical School	(1914)	Mass.
University of Michigan Medical School	(1934)	Michigan
University of Tennessee College of Medicine	(1933, 2)	Tennessee
Baylor University College of Medicine	(1927)	Texas
Medical College of Virginia	(1899) North Carolina, (1934)	California
University of Virginia Department of Medicine	(1931)	Maryland

LICENSED BY ENDORSEMENT

School	Year Grad.	Endorsement of
College of Medical Evangelists	(1933)	N. B. M. Ex.
Johns Hopkins University School of Medicine	(1930)	N. B. M. Ex.
Harvard University Medical School	(1933)	N. B. M. Ex.
Columbia Univ. College of Physicians and Surgeons	(1928)	N. B. M. Ex.
University of Virginia Department of Medicine	(1906)	U. S. Navy

* Verification of graduation in process.

Book Notices

Social Security in the United States: An Analysis and Appraisal of the Federal Social Security Act. By Paul H. Douglas, Professor of Economics, The University of Chicago. Cloth. Price, $3. Pp. 384. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1936.

In the opinion of the author, the federal social security act was, at the time of its enactment, the most important statute passed under the present national administration but full of weaknesses, strikingly incomplete, and merely a first step, which must soon be followed by others. The criteria by which he measures the act and prescribes for its shortcomings, he does not state. "Social security" is neither defined nor described. As to the optimum of social security for which the people may reasonably strive, he expresses no opinion. The limit below which social security cannot safely fall is not stated. How far it is safe to go in attempting to establish social security for some classes of the people, with necessary incidental impairment of the rights and privileges of others, the author does not say. In the absence of an understanding between the author and his readers concerning such matters as these, his appraisal of the act loses much of its value. It becomes merely the author's unsupported dictum.

So far as can be judged from his book, the author is strongly in favor of the concentration of more authority in the federal government, if not under the present constitution or by evading its intent, then by amending it. Under the enlarged social security scheme proposed by the author, the states might easily become nothing more than vassals of the federal government. The federal government, if unable to dominate by direct constitutional authority, would control through its taxing power, mulcting the people of the several states of any amount of money the central government might desire and distributing the money thus collected as subsidies, bonuses or bribes to compel or induce the subservient states to do its bidding. The social security act is already replete with federal requirements to which a state must subject itself and its people before it can obtain from the federal treasury money appropriated under authority of the act, previously exacted by the federal government of the people of the states. The author, however, would go further and have the federal Social Security Board given power to see that adequate old age pensions are paid by the several states, but how the board is to determine in each case the adequacy or inadequacy of an old age pension, and the nature of the "power" with which the board is to be vested in order to enable it to compel compliance with its mandates, the author does not say. The author would have "the federal administrative authorities" vested with the power to lay down minimum standards for the government of the several states in the selection, tenure and promotion of those state and local officials charged with the administration of various sections of the social security act, a civil service ideal that the federal government seems not yet to have attained after many years of striving, even in the management of its own affairs.

If, however, the author would have Congress augment the authority of federal officials over the governments of the several states, he is apparently willing to pay the price and would add largely to the appropriations that the social security act now authorizes Congress to make, returning to the people of the several states as subsidies, bonuses or bribes for good behavior some or all of the money collected through federal levies, direct or indirect, previously imposed on those very same people. Federal subventions for old age pensions should be increased, the author says, from $15 a month to at least $20 a month. The social security board should be given "a considerable sum of money to grant as outright aid for pensions to states which are particularly poor." The federal government should pay at least a portion of the costs of the unearned annuities of the older workers, now authorized by the social security act, and not saddle such costs on the younger workers. There the author's consideration for the younger workers seems to end, for he proposes that the social security act be so amended as to allow aged annuitants to continue their employment in industry while receiving their annuities and he would thus limit opportunities for the younger generation as it reaches an employable age. Additional federal funds should be obtained, according to the author, for aiding states with high unemployment rates to maintain minimum benefits and to provide benefits for workers who migrate from state to state. If the constitutionality of the present federal system of old age insurance is upheld, the existing federal-state tax offset system of unemployment insurance, if the author is to have his way, would be transformed into a strictly federal system. If the constitutionality of both the federal system of old age insurance and the federal-state tax offset system of unemployment insurance is denied, the author suggests that the federal government may still establish a federal-state system of unemployment insurance through a 100 per cent grant-in-aid to the states, to induce them to maintain unemployment insurance in accordance with standards presumably dictated and enforced by the federal government. The author would have the present federal grants in behalf of mothers' pensions increased so as to meet one half of the total cost, instead of one third as at present.

A system of health insurance is proposed which the author believes "will provide a more even distribution of the costs of medical care and also a cash benefit to compensate in part for the loss of earnings." Health insurance, he believes, will sweep a much larger proportion of the population into the ranks of paying patients than is at present the case, and despite the opposition of the official leaders of the medical profession it would be of real economic benefit to the rank and file of practitioners; but he submits nothing to show the relation of costs to benefits, primary and ultimate. Whether he would have the states made to comply with the federal will with respect to health insurance through subsidies, bonuses and bribes, or brought under federal control through a federal-state tax rebate system or, as the author proposes with respect to old age pensions and state administrative service, simply empower the social security board to make the state do what the board may determine with respect to the matter, the author does not state.

There would be no difficulty, if the author's views are correct, in meeting the large increase in the expenses of the federal government necessary to carry into effect his suggestions for a larger participation in his extended social security scheme, for he has a ready formula whereby the increase may be met:

> Nothing will be gained however [he says] if these funds are then derived from taxes on consumption. In order that these costs may be borne with the least sacrifice, they should be met from taxes on excess profits and on the upper brackets of personal incomes. For the workers are already severely burdened both by the present system of financing social insurance and by the numerous state sales taxes.

But if we are to provide real social security for the employed population, according to the author, it is not enough to insure against the interruptions of working class incomes; it is necessary also to raise the levels of those incomes "to an adequate amount." Fortunately, the author has a simple formula for accomplishing this end, stated as follows:

> The best way of meeting this situation, as long as we retain the capitalistic system, is to increase the level of wages itself. This can be done by an increase in the technical efficiency of industry, by a greater growth in the quantity of capital than of labor with a consequent increase in the marginal productivity of the latter, and also by a decrease in the power of monopolies and of all impediments in the way of price competition which cause labor to be paid less than its net social productivity.

If the author has devised any method by which this system of raising necessary funds can be successfully applied to capital, industry or labor, his services should be in great demand.

The author is probably at his worst when he discusses the legal aspects of the social security act. His direct statement that the constitutionality of the Sheppard-Towner Maternity and Infancy Act was upheld by the Supreme Court in the case of *Massachusetts* v. *Mellon*, 262 U. S. 447, 43 Sup. Ct. 597, is directly contrary to the fact; and when the author implies that a phrase used in that opinion is "a direct and positive affirmation of the constitutionality of federal aid," he ignores the purport of the decision as a whole. Incidentally, when, in support of the Sheppard-Towner Maternity and Infancy Act and impliedly of federal subsidies generally, he cites figures that the reader who is not technically informed may construe as evidence of benefit derived from the act named and ignores a vast mass of figures to the contrary, he lays himself open to a charge of special pleading. When he implies that our written constitution is so inflexible as to "confine us to the straitjacket of narrow powers" and to force "those who are seeking to adapt the activities of the government to the needs of the times" to resort to political contrivances and legal fictions, he does so either in ignorance of the provisions of the constitution or ignoring them; for the constitution requires nothing of any one except compliance to its agreed terms, which make ample provision for amending the instrument in an honest and open and above board way, as and when circumstances render it expedient to do so. If "those who are seeking to adapt the activities of the government to the needs of the times" will present their views to the people through the orderly process laid down by the constitution, the people themselves will determine whether any such adaptation as is proposed is in the public interest.

This book contains an admirable historical analysis of the federal social security act. As an appraisal of the act and as a proposal for its future enlargement, however, it must be looked on primarily as propaganda unsupported by adequate evidence.

Kurzwellentherapie. Von Dr. Josef Kowarschik, Primararzt und Vorstand des Institutes für Physikalische Therapie im Krankenhaus der Stadt Wien. Paper. Price, 9.60 marks. Pp. 140, with 147 illustrations. Vienna: Julius Springer, 1936.

This monograph should prove of value to physicians interested in such a controversial field as short wave diathermy. The first two chapters are devoted exclusively to the physics of high frequency currents and the apparatus. Many physicians find physics an uninteresting topic or too much involved in higher mathematics for a thorough appreciation. However, Kowarschik has the happy faculty of dealing with this subject in a clear and simple way. His points are clarified by the use of simple analogies. The technic of application is well outlined and illustrated in the third chapter. For those physicians new to this field of therapy, this chapter should prove of real value. One should be warned however against such unfortunate statements as that the farther the electrodes are from the body the greater will be the depth of heating. Again, the impression is given that one can measure the dosage delivered to the patient. At present this is not possible. The suggestion that ten minutes' treatment may prove efficient would hardly seem warranted. It is refreshing to find the author stating that as yet no special wavelength has been found for specific diseases, which corroborates the observations of many English and American workers. Kowarschik stresses the need for good apparatus in giving general body treatments and states that wavelengths of from 12 to 30 meters serve this purpose best. He suggests the use of some absorbent material to prevent the accumulation of moisture on the skin surface, which is frequently the cause of most electrical burns. It is interesting to note that, in addition to the usual pad (condenser) type of electrode application, Kowarschik advocates the use of the coil electrode, which is quite similar to the method popularized in this country by the inductive type of heating. He gives a few technics that will be new to many physicians in this country.

The fourth chapter is given over to the biologic action of short waves. This is the weak spot of the book. Experiments in vitro are cited the accuracy of which is not doubted, which have been repeated in this country many times. These experiments have been used to show that certain wavelengths have selective heating effect. That these phantom model experiments cannot be carried over in in vivo experiments has been shown by many workers in various countries. The author states that colloidal suspensions can be selectively heated. This is true but can be explained by the so-called point heating of Esau. Few research workers in this country are willing to accept the theory of the killing of bacteria in human tissues by such a mechanism. He states that it is difficult to prove any specific electrical effect. All the physiologic effects cited are readily explainable as the effort of the body to elminate heat that is generated in the tissues. The author states that certain wavelengths have a greater effect on the bacteria than do others. This again is a statement that would not seem to hold in the light of the work of other workers. He does state, however, that nothing very definite has been established, owing to the variable nature of the different bacteria. That short waves have a decided action on neoplasms of human beings is a statement that cannot be accepted without demanding some definite evidence; certainly none seems to be forthcoming. The chapter closes with an excellent warning about the danger of burns, both superficial and deep. The author does not give the impression that burns are not possible with this therapy, as so many physicians have been led to believe. The fifth chapter gives a list of diseases that are amenable to short wave therapy and here the author is rather optimistic.

The monograph is well written, clear, concise and well illustrated. If one is familiar with the entire literature of short wave therapy he is well fortified against misinterpretation of the experimental material presented. The novice, on the other hand, would do well to familiarize himself well with current literature to avoid the many pitfalls presented in the fourth chapter.

The Next Hundred Years: The Unfinished Business of Science. By C. C. Furnas, Associate Professor of Chemical Engineering, Yale University. Cloth. Price, $3. Pp. 434. Baltimore: Williams & Wilkins Company, 1936.

In this volume an author with a fine sense of satire indicates the way in which science has failed to meet its responsibilities and obligations. As might be expected, a man without medical training is likely to be a little weak in his approach to the medical problem, as, indeed, he is weak in his approach to the problems of other fields of science where he has had insufficient training. He is inclined to believe in compulsory sickness insurance or even socialized medicine as the solution to the problem of medical distribution and medical care for all the people, and it is apparent that his reading in these matters is exceedingly limited and that the limitations have been still further restricted to the literature conferred on him by propagandists. Nevertheless, the book is exceedingly well written and most provocative and stimulating in relationship to the paths which research must follow in the future.

The Adopted Child. By Eleanor Garrigue Gallagher. Cloth. Price, $2.50. Pp. 291. New York: Reynal & Hitchcock, Inc., 1936.

This is a dispassionate yet warmly human discussion of the problems of the adopted child and the adoptive parents. The author considers both with unusual understanding, not forgetting the interest of society in the correct solution of the problems involved in the placing of children who for one reason or another, usually illegitimacy, cannot be kept with their own parents. She has no illusions about the very real disadvantages suffered by the child born out of wedlock, and she regards with scorn the sentimentality involved in deleting the record of illegitimacy from the official certificate of birth. She differs sharply with many of the practices now current in the placing of children, especially the granting of power to make and enforce rules to so-called state boards of control. She considers that two states, at least, in which social progress by legislation has been greatly extolled, have achieved nothing but the ineptitude of intrenched bureaucracy. She condemns particularly the three months nursing rule, under which unmarried mothers must nurse their babies for three months, thus postponing placement to no good purpose. On the other hand, she is not wholly convinced that everything which goes under the name of social work by voluntary agencies is necessarily as valuable as its sponsors would like to make it appear. She is bold enough to declare her belief that social workers are not omniscient and should not be so regarded, even by themselves. Yet she demands good social case work for the placement of babies, meanwhile announcing the heretical—in this day and age—dictum that intelligence and experience automatically qualify a volunteer worker without the necessity for elaborate academic training. Knowing intimately the problems involved

in adoption, viewing them sensibly and realistically, she has the courage to express her views without compromise. The book is a valuable contribution and should be welcomed by adoptive parents, either actual or prospective, by open minded social workers and legislators, and by physicians and nurses. The medical chapters are excellent. There is a detailed description of the technic at the famous Evanston nursery The Cradle, both social and medical technic being well explained. Appendixes describe the procedure of adoption in Illinois in some detail, in the other states in briefer form, and in other countries. This is a book to inform and to stimulate thought, and it will be a hard-hearted reader who will not be moved by some of its passages.

Traité d'urologie. Par G. Marion, professeur de clinique urologique à la Faculté de médecine de Paris. In two volumes. Third edition. Cloth. Price, 220 francs, per set. Pp. 687; 689-1232, with 608 illustrations. Paris: Masson & Cie, 1935.

In general this treatise on urology is quite complete and will be found valuable both as a text and as a reference book. The two volumes contain sections on anatomy, examination, symptomatology, urethroscopy and cystoscopy, pathology and treatment, urologic formulas and operative technic. The arrangement of the material is unusual and is not without merit. The various lesions are considered under the heading of general and etiologic factors, symptomatology, pathology with diagnosis and treatment. The surgical treatment is considered last in a separate chapter comprising about 20 per cent of the contents. It is an excellent outline of the subject and reflects the unusual surgical knowledge of the author. The clinical consideration of surgical diseases of the kidney occupies a much larger proportion of the volume than is usually found in similar publications. While various items are stressed which do not usually appear in the average American or English books on urology, this different point of view will be found most valuable. The pages devoted to laboratory diagnosis and tuberculosis are especially recommended. The urethroscopic and cystoscopic colored plates are unusually complete. To those who are accustomed to using the old French calibration, the new calibration, in which the graduations are by ⅓ mm., is confusing. There are several objections which could be raised from the American urologist's standpoint. Vesiculography is described as done only by vasotomy, and pneumopyelography is recommended in calculous disease. More serious is the reservation of intravenous urography for only those cases in which ureteral catheterization is impossible, rather than its routine employment preliminary to cystoscopy as we are accustomed to use it. The great effect of dehydration as a cause of postoperative anuria is not mentioned. The malignant nature of bladder papillomas is not stressed even though the similar tumor of the renal pelvis is considered malignant, and nephroureterectomy is advised. On transurethral prostatic resection there is an inadequate section—four pages—which coincides with the statement in the text that "resection does not greatly increase the possibilities of cure of prostatic hypertrophy." Similarly there is no mention of resection under discussion of malignancy of the prostate gland, and suprapubic operation is advised. The technic of nephrolithotomy is much more carefully described than that of pelviolithotomy, even though the latter is recommended. The section on the care of hypospadias and cryptorchidism is poor, as modern operations are not described. The ketogenic diet is found among the urologic formulas, where it probably belongs. There is appended a quite complete index. Altogether it is an excellent treatise on the subject of urology and should merit careful consideration and frequent reference.

The Undaunted. By Alan Hart. Cloth. Price, $2.50. Pp. 310. New York: W. W. Norton & Company, Inc., 1936.

This is the second novel by a far western physician to be published by the present publisher. It circulates around the thesis that present medicine and medical practice are wasteful, that the physician who would engage in research has a difficult time and that life in general is no bed of roses. Nevertheless, it gives a better picture of the medical scene than most medical novels and for that very reason is likely to be read with interest by many physicians. The author has not, however, developed as yet the ability to tell a story, and that ability is the prime requisite for success in the production of a novel.

From a Surgeon's Journal, 1915-1918. By Harvey Cushing. Cloth. Price, $5. Pp. 534, with 35 illustrations. Boston: Little, Brown & Company, 1936.

Much of this volume has already been published in the *Atlantic Monthly*, where it attracted wide attention. The place of Harvey Cushing as a man of letters in the field of medicine is well established. No one doubts his ability to observe and to write brilliantly of what he sees. His war diary, as assembled in this volume, has been culled from a vast amount of material in order to make a book readable by physicians and laymen alike. No doubt there have been removed sections dealing with the horrible and disgusting as well as other sections dealing with the detail of medical and surgical procedure during the war. The result is a volume which is exceedingly readable and which in general maintains interest. Reviewers who have already commented on this volume seem to have been disturbed most by the failure of Dr. Cushing to discuss from a philosopher's point of view the evils and the horrors of war. They forget, no doubt, that the surgeon during war is confronted with a task which leaves little opportunity for philosophy or soliloquy. He must repair the shattered bodies that come to him in order to get them back to the front as soon as possible. Should he pause to disturb himself with reflection on the performance, he would not be qualified to continue in that performance. As a scientific observer Dr. Cushing has concerned himself primarily with presenting an accurate picture of his own work. His eminence in the medical profession and his skill in his chosen field are such that his opportunities for association with the great and the near-great in all the warring nations were exceptional. This is apparent in his book and gives it added interest. It is inconceivable that any surgeon, regardless of how little he may read in general, could fail to be interested by this superb volume.

Treatment of Fractures in General Practice. By W. H. Ogilvie, M.D., M.Ch., F.R.C.S. Volumes I and II. Second edition. Cloth. Price, 2s. 6d., per set. Pp. 108; 109-180, with 37 illustrations. London: John Bale, Sons & Danielsson, Ltd., 1936.

These two pocket-size books contain a large amount of material that has been crystallized for the general practitioner. An attempt has been made to give the practical outline of fracture treatment in the confines of 180 pages. The author has included his own experience and the accepted practices on the continent, including the teaching of Böhler of Vienna. In volume I the general principles of fracture treatment are outlined and the treatment of fractures of the upper extremities and shoulder girdle is given. The author believes that the periosteum is a fibrous limiting membrane, carrying nourishment to the surface layers of bone, and, during the growth period, firmly adherent to the superficial osteoblasts. He does not believe that periosteum itself is osteogenic. Volume II includes fractures of the lower extremities and pelvis. An illustration of the Watson Jones modification of the Smith-Petersen pin does not rightly belong in a book of this small size. It is regrettable that the author did not include a description of the Leadbetter method of closed reduction of fracture of the neck of the femur. The illustrations are highly diagrammatic, which adds to their teaching value. The little books furnish interesting reading, most of which is authoritative and should be helpful.

Great Doctors of the Nineteenth Century. By Sir William Hale-White, K.B.E., M.D., LL.D., Consulting Physician to Guy's Hospital. Cloth. Price, $5; 15s. Pp. 325. Baltimore: William Wood & Company, 1935.

The title of this book is hardly accurate, since it is concerned not with all great doctors of the nineteenth century but specifically with seventeen prominent British physicians and surgeons. It begins with Edward Jenner and includes as well Sir Astley Paston Cooper, Sir Charles Bell, Richard Bright, Marshall Hall, Thomas Addison, William Stokes, Sir James Young Simpson, Sir James Paget, Sir William Bowman, Sir John Simon, Sir William Withey Gull, Sir Samuel Wilks, Lord Lister, John Hughlings Jackson, Sir Patrick Manson and Sir Ronald Ross. The biographies are nicely written, sharp, illustrated with anecdotes and indicative of the contributions to science which made their subjects eminent. Among the best of the biographies is that dealing with Sir James Young Simpson, but all of them are more than worthy the time of any physician interested in medical history.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Hodgkin's Disease Attributed to Trauma.—The employee, during the course of employment, received a blow on the side or back of his neck. Thereafter he complained that his neck and throat hurt him and his neck appeared to be swollen. About seven months after the injury, the employee died from Hodgkin's disease and his widow applied for compensation under the workmen's compensation act of Kentucky. The industrial board dismissed the application and, after the circuit court had affirmed the action of the commission, the claimant appealed to the Court of Appeals of Kentucky.

A chiropractor who treated the employee for a period of two weeks shortly after the injury testified that he found an enlargement of the cervical glands and that the left half of the thyroid gland was much swollen. He testified that a bruise could have caused the swelling of the glands but that he had made no diagnosis. When asked if the patient was suffering from Hodgkin's disease, he replied "Yes sir, forerunners" [sic]. During the last month of his life the employee was under the treatment of a physician who testified that the symptoms he found were difficult breathing, temperature between 101 and 102 degrees, a considerable lump on the left side of the neck with some swelling on the other side, and that the cervical lymph nodes were involved. He testified that the cause of death was Hodgkin's disease and that from the history he obtained he could trace the disease only to the blow received by the employee on his neck. Three other physicians, described by the court as being qualified from experience and training to speak on the subject, testified that there is no relation between Hodgkin's disease and traumatic injury.

In denying the application for compensation, said the Court of Appeals, the compensation board found as a matter of fact that the employee died as the result of Hodgkin's disease, which had no relation to the blow the employee received on his neck. With this finding the court agreed and affirmed the judgment of the circuit court for the employer.—*Hale v. State Highway Commission (Ky.), 91 S. W. (2d) 23.*

Malpractice: Death from Asphyxiation Attributed to Negligent Administration of Anesthetic.—The defendant, a physician, administered the anesthetic during an operation performed on Mrs. Beulah Forbis. The patient died on the operating table and the husband and daughter of the deceased sued the defendant, claiming that the patient died from asphyxiation as the result of his negligent administration of the anesthetic. The superior court, Los Angeles county, gave judgment for the plaintiffs and the defendant appealed to the district court of appeal, second district, division 1, where judgment of the trial court was reversed (45 P. (2d) 215, abstracted, THE JOURNAL, Dec. 28, 1935, p. 2182). The case then came before the Supreme Court of California on appeal.

According to the evidence, said the Supreme Court, after the operation was performed and the operating surgeon was closing the incision, he requested a deeper anesthesia. The anesthetic used was ethylene gas, carbon dioxide gas, ether and oxygen. The defendant anesthetist, at the time of the request for deeper anesthesia, noticed that the oxygen in the tank was being depleted. He ordered a fresh supply. It took about five minutes to connect up the new tank, and when this had been completed, the patient was dead. The nurse who assisted in the operation testified that the defendant continued to administer the anesthetic while the oxygen supply was being replenished and that the anesthetic mask was held on the patient's face by the defendant during that time. An osteopath, testifying for the plaintiffs, stated in answer to a hypothetical question that the deceased died of asphyxiation resulting from the administration of ethylene gas without oxygen. The medical testimony was in agreement that the breathing of ethylene gas without oxygen for a few minutes would probably be fatal. The defendant contended that the patient died from heart failure and that he did not hold the mask tightly over the patient's face during the period of the change of oxygen tanks, but kept his finger under the mask, raising it slightly so that the patient could breathe. Medical experts testified for the defendant that the patient's symptoms, particularly a drop in blood pressure prior to cessation of respiration, indicated death from heart failure and that the symptoms of asphyxiation were not present.

Although the weight of expert medical opinion for the defendant, said the Supreme Court, was greater than that for the plaintiffs, there was sufficient direct evidence supporting the plaintiffs' theory of the cause of death to justify a submission of the case to the jury. In the absence of prejudicial error committed by the trial court, the jury's verdict is binding. The opinion of an expert witness, continued the court, does not become valueless by reason of the omission from a hypothetical question of some disputed facts. "The question may be framed upon any theory of the questioning party which can be deduced from the evidence, and the statement may assume any facts, within the limits of the evidence, upon which the opinion of the expert is desired. It may omit any facts not deemed by the questioner material to the inquiry." *Treadwell* v. *Nickel,* 194 Calif. 243, 228 P. 25.

The court, finding no prejudicial error in the record, affirmed the judgment of the superior court for the plaintiffs.—*Forbis v. Holzman (Calif.), 55 P. (2d) 201.*

Society Proceedings

COMING MEETINGS

Academy of Physical Medicine, Boston, Oct. 20-22. Dr. Franklin P. Lowry, 313 Washington St., Newton, Mass., Secretary.

American Academy of Ophthalmology and Otolaryngology, New York, Sept. 26-Oct. 3. Dr. William P. Wherry, 107 South 17th St., Omaha, Executive Secretary.

American Association of Industrial Physicians and Surgeons, Atlantic City, N. J., Oct. 5-6. Dr. Volney S. Cheney, Armour and Co., Union Stock Yards, Chicago, Secretary.

American Association of Railway Surgeons, Chicago, Nov. 5-7. Dr. Daniel B. Moss, 547 West Jackson Blvd., Chicago, Secretary.

American Clinical and Climatological Association, Richmond, Va., Oct. 19-21. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Philadelphia, Oct. 19-23. Dr. George W. Crile, 40 East Erie St., Chicago, Chairman, Board of Regents.

American Hospital Association, Cleveland, Sept. 28-Oct. 2. Dr. Bert W. Caldwell, 18 East Division St., Chicago, Executive Secretary.

American Public Health Association, New Orleans, Oct. 20-23. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Roentgen Ray Society, Cleveland, Sept. 29-Oct. 2. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia, Secretary.

Associated Anesthetists of the United States and Canada, Philadelphia, Oct. 19-23. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of American Medical Colleges, Atlanta, Ga., Oct. 26-28. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Association of Military Surgeons of the United States, Detroit, Oct. 29-31. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Association of Obstetricians and Gynecologists, Detroit, Oct. 15-17. Dr. Ralph A. Reis, 104 South Michigan Blvd., Chicago, Secretary.

Delaware, Medical Society of, Rehoboth, Oct. 12-14. Dr. William H. Speer, 917 Washington St., Wilmington, Secretary.

Indiana State Medical Association, South Bend, Oct. 6-8. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, St. Paul, Oct. 12-16. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Kansas City Southwest Clinical Society, Kansas City, Mo., Oct. 5-8. Dr. J. V. Bell, 1103 Grand Ave., Kansas City, Mo., Secretary.

Kentucky State Medical Association, Paducah, Oct. 5-8. Dr. Arthur T. McCormack, 532 W. Main St., Louisville, Secretary.

Michigan State Medical Society, Detroit, Sept. 21-24. Dr. C. T. Ekelund, 35 West Huron St., Pontiac, Secretary.

Mississippi Valley Conference on Tuberculosis, Peoria, Ill., Sept. 24-26. Mr. A. W. Jones, 613 Locust Street, St. Louis, Secretary.

Mississippi Valley Medical Society, Burlington, Iowa, Sept. 30-Oct. 2. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Reno, Sept. 25-26. Dr. Horace J. Brown, 20 North Virginia St., Reno, Secretary.

Ohio State Medical Association, Cleveland, Oct. 7-9. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 26-30. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Oregon State Medical Society, The Dalles, Oct. 8-10. Dr. Morris L. Bridgeman, 1020 S.W. Taylor St., Portland, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, Oct. 5-8. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Tri-States Medical Society of Texas, Louisiana and Arkansas, Longview, Texas, Oct. 26-27. Dr. John M. Ellis, Mt. Pleasant, Texas, Secretary.

Virginia, Medical Society of, Staunton, Oct. 13-15. Miss Agnes V. Edwards, 1200 East Clay St., Richmond, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

32: 1-182 (July) 1936

*Histopathology and Treatment of Vaginitis: I. Histopathology; II. Biochemical Approach in Treatment. F. L. Adair and H. C. Hesseltine, Chicago.—p. 1.

Hydrogen Ion Concentration of Human Vaginal Discharge. F. W. Oberst and E. D. Plass, Iowa City.—p. 22.

*Study of 308 Cases of Placenta Praevia. F. C. Irving, Boston.—p. 36.

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Further Improvement in Pelvimetric Roentgenography. J. B. Jacobs, Washington, D. C.—p. 76.

Primary Cancer of Fallopian Tubes: Report of Three Cases: Summary of Cases Omitted from Nürnberger's Report (1931) and Those Recorded to 1935. M. R. Robinson, New York.—p. 84.

Progesterone Treatment for Dysmenorrhea. C. A. Elden and K. M. Wilson, Rochester, N. Y.—p. 91.

Use of Paraldehyde Analgesia in Labor, Including Studies of Effect on Uterine Contraction. S. F. Moore Jr. and R. A. McCurdy, Cleveland.—p. 97.

*Quantitative Friedman Test in Hydatidiform Mole and Vomiting of Pregnancy: Preliminary Report. F. J. Schoeneck, Syracuse, N. Y.—p. 104.

Use of Progesterone in Combating Habitual Abortion. H. F. Kane, Washington, D. C.—p. 110.

Intramuscular Injection of Vitamins A and D Concentrates During Pregnancy: Preliminary Report. B. B. Finkelstone, J. H. Howard and M. Paris, Bridgeport, Conn.—p. 113.

Factors Affecting Incidence of Puerperal Morbidity, with Especial Reference to Effects of Vaginal and Rectal Examinations Performed During Labor. H. J. Gegerson, A. A. Gegerson and S. L. Penner, New York.—p. 118.

*New Concept of Senile Vaginitis. J. W. Simpson and K. E. Mason, Nashville, Tenn.—p. 125.

Evaluation of Hypophyseal Factor in Interpretation of Endometrial Changes. J. W. Simpson, E. T. Ellison, Doris Phelps and J. C. Burch, Nashville, Tenn.—p. 129.

Effects of Progestin on After-Pains: Preliminary Report. S. Lubin and F. J. Clarke, Brooklyn.—p. 134.

Results of Treatment in Placenta Praevia: Based on Study of 283 Cases from the Jewish Hospital of Brooklyn. J. Ronsheim, Brooklyn.—p. 139.

Polyneuritis of Pregnancy: Report of Four Cases. A. W. Bingham, East Orange, N. J.—p. 144.

Endometriosis During Final Month of Pregnancy: Marked Decidual Reaction About Endometriosis Nodules in Preperitoneal Fat. H. J. Olson and G. H. Hansmann, Milwaukee.—p. 148.

Forty-Nine Pound Retroperitoneal Cystic Fibroid. H. E. Lindeman, New York.—p. 151.

Abdominal Pregnancy at Term with Delivery of Normal Living Child. E. B. Woods, Augusta, Ga.—p. 155.

Diabetes Complicating Pregnancy. C. H. Ill, Newark, N. J.—p. 157.

New and Efficient Method of Infant Circumcision. D. A. Calhoun, Troy, N. Y.—p. 159.

Decidua Polyposa with Abnormal Adhesions. J. Lebovitz, Woodside, N. Y.—p. 160.

Myxofibrosarcoma of Ovary. C. H. Hixson, Washington, D. C.—p. 162.

Abdominal Aneurysm. F. H. Falls, Chicago.—p. 164.

Metastatic Carcinoma to Ovary from Vocal Cord. J. D. Kirshbaum, Chicago.—p. 165.

Interstitial Pregnancy. A. E. Kanter, Chicago.—p. 167.

Histopathology and Treatment of Vaginitis.—Adair and Hesseltine have cured vaginal trichomoniasis and senile vaginitis with lactose (95 per cent) and citric acid (5 per cent) therapy. Focal infections have been treated simultaneously. Although recurrences have developed, there have been no failures as yet. Generally, vaginal trichomoniasis and senile vaginitis respond slowly to treatment. The maximal period of treatment and observation was ten months in one instance, while the minimum was two months. Some recurrence of vaginal trichomoniasis and probably some exacerbations are due to reinfection and reinfestation from sexual partners. The principle of this type of therapy is to supply directly nutritive substances which are necessary for a normal vaginal flora. This nutritive material may be supplied indirectly as a result of hormone stimulation after the menopause. The histopathologic pictures obtained by biopsy from the vaginal wall in trichomoniasis, mycoses and senile vaginitis are not distinguishable. Biopsies from the vagina have revealed that even though the clinical appearance and smears are normal, inflammation may continue to exist in the epithelial and subepithelial layer for varying periods. The microscopic examination indicates an increased number of glycogenic granules in the epithelial cells of the treated cases, the deposition of which may be a factor in producing the beneficial effects of this treatment. The excellent results may be from the creation of conditions that favor the development of a normal vaginal flora or from factors that permit or stimulate normal epithelial growths, or a combination of the two.

Study of Placenta Praevia.—Irving discusses the 308 cases of placenta praevia that were seen from 1916 to 1935, among 28,391 deliveries in the inpatient service of the Boston Lying-In Hospital. The actual delivery of these 308 patients was conducted by eighty-five visiting and resident obstetricians, the latter always under supervision. A general analysis of the various types of treatment used in the entire series shows that they may be classified as (1) expectant, consisting of simple rupture of the membranes, or normal or operative delivery at full dilatation, (2) cesarean section, (3) Braxton Hicks version, (4) the Voorhees bag, and (5) accouchement forcé. A study of the cases shows a decrease in maternal mortality from 11.6 to 2 per cent, and a decrease in net fetal mortality from 47 to 20.3 per cent. In clean cases in which the infant is alive, normal and of an estimated weight of more than 4 pounds, cesarean section offers about an 85 per cent chance of securing a living child, with a risk to the mother not exceeding 5 per cent. In clean cases in which the infant is dead, deformed or less than 4 pounds in estimated weight, Braxton Hicks version may be performed by the trained obstetrician at no greater risk to the mother than cesarean section. In clean cases of marginal placenta praevia, simple rupture of the membranes deserves an extended trial. It is safe for the mother and apparently less injurious to the child than has been supposed. In infected cases, cesarean section followed by hysterectomy is the operation of choice regardless of the condition of the child.

Quantitative Friedman Test in Hydatidiform Mole.—Schoeneck tried to determine the minimal amounts of urine, at various stages of pregnancy, required to produce positive Friedman reactions. With such normal standards established, a quantitative Friedman test is made available. Nonpregnant does weighing at least 1,500 Gm. and between 16 and 18 weeks of age were used. All animals were of the same or similar breeds and were obtained from the same source. Fractional intravenous injections of known pregnancy urines were made in dilutions of 0.025, 0.05, 0.1, 0.5, 1 and 3 cc., and so on. From two to six rabbits were used for each test. The animals were laparotomized forty-eight hours after the injections. Corpora haemorrhagica or fresh corpora lutea were the criteria for a positive reaction. In general, the smallest amounts gave positive reactions between the sixth and tenth weeks of pregnancy. Sixty-seven quantitative determinations were made on forty-one known pregnant patients. The smallest amount of urine that gave a positive reaction in normal pregnancy was 0.05 cc. The maximal amounts varied between 3 and 5 cc. The results of the quantitative test in four cases of hydatidiform mole and one of chorionepithelioma are given. A wide variation (between 0.0063 and 5 cc.) is noted in the mole cases. Two cases of hydatidiform mole showing marked hyperexcretion of the substance responsible for the reaction exhibited typical textbook specimens of hydatidiform mole, i. e., grapelike masses of vesicles, whereas in the other two instances the specimens were made up principally of fibrous tissue with comparatively few vesicles. The composite results of eighty-four quantitative tests on fifty-six pregnant patients show that the group in which nausea and vomiting were absent required more urine to produce positive results than did the groups

in which these symptoms were present. The contrast is especially marked between the nausea and vomiting group and that including the pernicious vomiting cases. In the pernicious vomiting cases, as the symptoms abated, the amount of urine required to produce a positive reaction increased. While there is insufficient evidence to advance a hormone explanation of the cause of vomiting of pregnancy, the evidence seems important enough to warrant continued investigation.

Senile Vaginitis.—Simpson and Mason offer evidence that, in thirty cases of senile vaginitis observed, an increased intake of vitamin A, in the form of cod liver oil or halibut liver oil, proved unusually effective in producing rapid relief of the symptoms and in gross and histologic repair of the vaginal lining. They attribute these effects to the beneficial action of vitamin A in restoring to a normal healthy state the vaginal epithelium suffering from a chronic low grade deficiency of this vitamin.

American Journal of Psychiatry, New York

92: 1247-1484 (May) 1936

The Relationship Between Body Build and Serum Lipoids and Discussion of These Qualities as Pyknophilic and Leptophilic Factors in Structure of Personality. E. F. Gildea, E. Kahn and Evelyn B. Man, New Haven, Conn.—p. 1247.
The Cult of Curability, Its Rise and Decline: A Page from Psychiatric History. A. Deutsch, Philadelphia.—p. 1261.
Antiretentional Therapy in Conditions Ascribed to Intracranial Liquid Accumulation. E. Földes, New York.—p. 1281.
Psychic Stresses and Culture Patterns. A. I. Hallowell, Philadelphia. —p. 1291.
Overlapping Symptoms in Catatonic Excitement and Manic Excitement. C. A. Bonner and Grace H. Kent, Hathorne, Mass.—p. 1311.
Hematoporphyrin Treatment of Melancholia and Endogenous Depression. J. Huehnerfeld, Telgte i. W., Germany.—p. 1323.
Concerning Schizophrenia and Manic-Depressive Psychosis Associated with Pregnancy and Childbirth. G. M. Davidson, Ward's Island, N. Y.—p. 1331.
Suicide Among Civilized and Primitive Races. G. Zilboorg, New York. —p. 1347.
Some Points of Comparison and Contrast Between Treatment of Functional Disorders by Apache Shamans and Modern Psychiatric Practice. M. E. Opler, New York.—p. 1371.
Study of Alcoholism in Men. J. H. Wall, White Plains, N. Y.—p. 1389.
Study of Case of Cyclic Psychic Disturbances Associated with Menstruation. W. A. Horwitz and M. M. Harris, New York.—p. 1403.
Infantile Amaurotic Family Idiocy: Megalocephaly and Cerebellar Atrophy. A. T. Steegmann and L. J. Karnosh, Cleveland.—p. 1413.
Value of Insulin Treatment in Undernourished Psychiatric Patients. A. E. Bennett and E. V. Semrad, Omaha.—p. 1425.
Treatment of Convulsions in Children. M. G. Peterman, Milwaukee.— —p. 1433.
Comparison of Weights of Brain, Liver, Heart, Spleen and Kidneys of Epileptic and Schizophrenic Patients. M. Moore and W. G. Lennox. —p. 1439.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.

36: 1-144 (July) 1936

Biologic Effects and Therapeutic Possibilities of Neutrons. G. L. Locher, Swarthmore, Pa.—p. 1.
Roentgenologic Criterion of Dermoid Cyst. D. B. Phemister, W. B. Steen and J. C. Volderauer, Chicago.—p. 14.
Congenital Cysts of Lung from Roentgenologic Viewpoint. B. R. Kirklin, Rochester, Minn.—p. 19.
Bronchography as Aid in Interpretation of Roentgen Shadows Caused by Pleuropulmonary Changes in Tuberculosis. B. P. Potter and J. Pagliughi, Secaucus, N. J.—p. 30.
Survey of Bone and Joint Tuberculosis in Detroit Municipal Sanatoria. C. C. Birkelo and F. J. Jarzynka, Detroit.—p. 44.
Cholecystocolic Fistula: Case Report. J. P. Medelman, St. Paul.—p. 52.
*Treatment of Subacromial Bursitis by Roentgen Irradiation. I. Lattman, Washington, D. C.—p. 55.
Lung Changes Subsequent to Irradiation in Cancer of Breast. E. E. Downs, Philadelphia.—p. 61.
*Sterilization in Carcinoma of Breast. E. G. Smith, Cleveland.—p. 65.
*Treatment of Cancer of Bladder by Divided Doses of Roentgen Rays at Long Distances. R. S. Ferguson, New York.—p. 73.
Radiosensitivity of Cells of Mammary Gland. C. W. Turner and E. T. Gomez, Columbia, Mo.—p. 79.
Dosimetry in Radiation Therapy: I. Gamma-Ray Measurements in Roentgens. O. Glasser, Cleveland, and L. Rovner, Chicago.—p. 94.

Treatment of Subacromial Bursitis by Roentgen Irradiation.—Lattman states that subacromial bursitis was first described by Codman in 1906. After discussing the etiology, the pathologic anatomy and the symptoms, he gives a tabular report of twenty cases in which roentgen therapy was employed. As a rule, he applied 350 roentgens with the following factors: 200 kilovolts; filter consisting of 0.25 mm. of copper; 50 cm. distance; fields of 15 by 15 cm. on the anterior or posterior side of the shoulder. The author asserts that the results obtained with this treatment justify the belief that roentgen therapy will relieve pain and restore function more rapidly than other methods of treatment. He treated many other cases with equally good results, but only in the twenty reported here has he been able to follow up the patients for a period ranging from one to five years.

Sterilization in Carcinoma of Breast.—According to Smith, it is well known that there is a definite relationship between the activity of the ovary and the histology and physiology of the breast. He cites a number of cases of carcinoma of the breast in which sterilization was brought about by applying from 600 to 1,200 roentgens anteriorly and also posteriorly to the pelvis. He found that certain cases of carcinoma of the breast in young women show marked improvement after irradiation of the ovaries with a sterilizing dose of roentgen rays. Improvement may be evidenced by disappearance of metastatic nodules in the skin, shrinkage of glands showing metastatic involvement, a better blood picture, change of the osteolytic type of bone lesion to the osteosclerotic type, alleviation of pain and a subjective feeling of general good health. No conclusions can be drawn at present on any effect roentgen irradiation of the ovaries may have on the time interval of appearance of metastases after irradiation. Only one of the patients has shown more than slight menopausal symptoms. At present the author has no reason to believe that sterilization prolongs the duration of life in these patients. His observation leads him to believe, however, that the course in sterilized patients is fairly good, terminating in a relatively sudden decline, whereas the course in unsterilized patients is a steady painful decline during which the patient is unable to live her usual life. Although no such comparable evidence of hormone influence has been shown to exist in other malignant conditions, experimentation in this direction deserves more attention and should be carried out. He believes that all women with carcinoma of the breast who have not reached the menopause should receive ovarian irradiation.

Roentgen Treatment of Cancer of Bladder.—Ferguson reports a series of forty-eight cases of tumor of the bladder treated by divided doses of roentgen rays at long distances. He began the treatment with a technic previously used: 200 kilovolts, 0.5 mm. of copper, 1 mm. of aluminum, 70 cm. target skin distance, 300 roentgens daily to each of two portals. With this technic it is possible to deliver to the pelvis from 2,000 to 2,700 roentgens through each of four portals. However, this total was seldom realized in the early cases owing to rectal mucositis and rectal and bladder tenesmus. The technic was gradually changed. At present it is as follows: 200 kilovolts, Thoraeus filter (equivalent of 1.62 mm. of copper), 100 cm. target skin distance, and 100 roentgens daily to each of two opposite portals. Four skin fields are used, the remaining two being treated on alternate days. With this technic totals of from 3,000 to 4,000 roentgens per field may be easily reached, thereby delivering a total of from 12,000 to 16,000 roentgens to the four skin portals. From these factors it was estimated that a bladder tumor at the average depth of 10 cm. in the body would receive from 10 to 13 threshold erythema doses, respectively, from 3,000 to 4,000 roentgens delivered to each of four skin fields, provided the four beams actually converged in the bladder. In summarizing the effects obtained with this treatment, the author says that of thirty-six cases, all verified by biopsy and subsequently observed cystoscopically, there were twenty complete regressions, with the appearance of a new tumor in but one of these cases. In the cases in which regression was incomplete, subsequent treatment was much simplified and usually consisted in fulguration and radon implantation in the base of the remaining tumor or tumors through the cystoscope. Treatment by this technic can be carried to a total of from 3,000 to 4,000 roentgens to each of four portals without marked constitutional effect and with very little local irritation to the skin, bladder and rectum. The rate of primary regression reported in this series of tumors of the bladder exceeds that observed with any previous form of irradiation with which the author is familiar.

American Journal of Surgery, New York

33: 1-170 (July) 1936

*Racial Trends of the Negro and White in Certain Surgical Diseases. U. Maes and Elizabeth M. McFetridge, New Orleans.—p. 5.
*Two Stage Amputation for Diabetic Gangrene of Leg. E. T. Crossan, Philadelphia.—p. 18.
Idiopathic Benign Hypertrophic Pyloritis (Billroth Hypertrophy). F. Cunha, San Francisco.—p. 21.
Traumatic Subdural Hematoma. W. D. Abbott, Des Moines, Iowa.—p. 32.
*Thymic Death and Meteorological Environment. S. A. Levinson, Chicago.—p. 36.
Differential Diagnosis of Hyperthyroidism. J. C. McClintock, Albany, N. Y.—p. 49.
Apparatus for Treatment of Fractured Os Calcis. V. Carabba, New York.—p. 53.
Acute Arterial Occlusions of Extremities. G. de Takáts, Chicago.—p. 60.
Rôle of Fibrous Tissue in Hernia Repair, with Especial Reference to Injection Therapy. A. P. Stoner, Des Moines, Iowa.—p. 68.
Management of Ruptured Appendix: Analysis of Fifty Consecutive Cases. J. M. Higginbotham, Chattanooga, Tenn.—p. 73.
Neoplasms Primary in Diverticula of Urinary Bladder: Report of Five Cases. C. C. Higgins, Cleveland.—p. 78.
Fracture of Spine. S. Kleinberg, New York.—p. 85.

Racial Trends in Certain Surgical Diseases.—Maes and McFetridge believe that the Negro has an apparent racial immunity to certain infections, chiefly of the streptococcic variety, to certain forms of malignant growths, chiefly of the superficial variety, and to biliary and urinary lithiasis. He is less likely to develop such diseases as appendicitis, cholecystitis and peptic ulcer but more apt to exhibit them in a graver form than does the white man. He is peculiarly susceptible to respiratory infections, and even in such diseases as empyema, in which the incidence is low, the mortality is prone to be high. The inescapable conclusion is that, as the Negro loses his immunity to the so-called acquired diseases or diseases of civilization, he tends to exhibit them in a virulent form, and that the virulence is aggravated always by his mode of life, his disregard of inaugural symptoms and his pernicious habit of self medication. The records of the Charity Hospital clearly prove that the Negro responds to certain diseases in a different fashion from the white man and usually in a more disastrous fashion. Every analysis of statistics from this institution ought to be made on the double basis of the Negro and white hospital population, for the surgeon who operates on Negroes, especially for acute or grave diseases, most of the time begins his work with a very heavy handicap.

Two Stage Amputation for Diabetic Gangrene of Leg.—Crossan declares that formal amputation for diabetic gangrene is fundamentally wrong. It involves, in the making of the flaps, dissection of one layer of tissue from another at the expense of some blood supply. The greatest assurance for the life of the patient can be secured by the guillotine or Einschmitt operation. This does not mean the modified flap operation, leaving the stump open, for that provides only for some drainage in case of infection; it does not exclude damage to circulation nor does it give the maximum amount of drainage. All the tissues should be cut at one level and preferably it should be done in the leg about two handbreadths below the tibial tubercle. Performed in this fashion there is little disturbance of the blood supply and small chance of gangrene, provided a tourniquet is not used. Also the stump is wide open and without recesses, with a minimum of devitalized tissue; in fact, it has everything that discourages suppuration. Secondary operation will be necessary to give a serviceable stump. This the author usually does after several weeks or when bacteria counts of the wound show only two or three in a field. Between operations the wound is dressed at weekly intervals with cod liver oil until clean enough to start bacterial counts; then dressings are done every other day. The secondary operation might take any form the surgeon may choose; a Carden or even a Stokes-Gritti operation may be done with safety, for the removal of the foot and portions of the leg has permitted the development of a good collateral circulation. Removal of the foot and leg also provides a more rapid circuit of blood and a better nourishment of the tissues.

Thymic Death and Meteorological Environment.—In view of the absence of any macroscopic and microscopic changes to account for unexpected death, and in the presence of an enlarged thymus and spleen, hyperplasia of the lymph glands with prominent Peyer's patches, associated with hemorrhage in Peyer's patches and intestinal tract, the diagnosis of "status thymicolymphaticus" was made. This diagnosis Levinson has employed in the unexpected deaths, particularly in infants and children, when they were referred to the coroner's office, and when a necropsy presented evidence indicating thymic death. Pathologic-anatomic proof for death cannot always be demonstrated. The absolute proof of the cause of death might be a functional disturbance associated with altered biochemical changes, disturbed pathologic-physiologic alteration, or constitutional variability markedly disturbed by extrinsic agents, such as physical and meteorological climaxes. Status thymicolymphaticus is a constitutional type. Sudden death here might occur when an unusual meteorological situation might require prompt physiologic adjustment. In view of the meteorological associations here determined, the emphasis that Paltauf placed on the fact that an anatomic change is not necessarily involved in sudden death of "status lymphaticus" finds its logical explanation in death due to a sudden chemical and endocrine upset of the type that Petersen has determined as common with meteorological changes. In a period of four years there were twenty-eight deaths in infants and children on whom a necropsy was performed and a diagnosis of status thymicolymphaticus was made. In 1932 the death certificates from the Chicago health department were investigated and indicated nineteen deaths from "status lymphaticus." In order to correlate the association of the adrenal with the thymus in reference to "sudden death," fifteen cases of Addison's disease are compared with thymic deaths for the year 1932 and the meteorological theory is supported in that death in Addison's disease also occurs when adrenal inadequacy would be manifest most acutely.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

20: 347-466 (July) 1936. Part I

Diagnosis of Gonococcal Infections by Cultural Method. Alice D. Leahy and C. M. Carpenter, Rochester, N. Y.—p. 347.
*Abnormalities of Micturition Due to Syphilis of Nervous System. O. R. Langworthy, J. E. Dees and L. G. Lewis, Baltimore.—p. 364.
Distant Thrombophlebitis Following Neoarsphenamine Injection. E. B. Tauber and L. Goldman, Cincinnati.—p. 382.
Medical and Surgical Aspects of Charcot Joints. S. H. Epstein, Boston.—p. 386.
*Relationship of Colitis and Proctitis to Lymphopathia Venerea. J. Goodman, New York.—p. 394.
Intolerance to Tryparsamide. A. G. Schoch, Dallas, Texas.—p. 408.
Cardiovascular Syphilis, with Especial Reference to Its Practical Management. W. H. Goeckerman and L. F. X. Wilhelm, Los Angeles.—p. 412.
Granuloma of Prostate Possibly Due to Syphilis. E. L. Keyes, New York.—p. 418.
Syphilis of Spinal Cord. N. W. Winkelman, Philadelphia.—p. 421.

Abnormalities of Micturition Due to Neurosyphilis.—Langworthy and his collaborators review bladder abnormalities characteristic of tabes dorsalis. They deal with the neurophysiology of the disturbances that are dependent on damage to the posterior sacral nerve roots. The vesical symptoms of which these patients complain are typical for this particular type of abnormality. Loss of sensation may be demonstrated in the vesical wall. Graphic records of vesical filling show a low resting intravesical pressure and a large volume. No waves of vesical contraction occur during filling. A case of vesical crises is described. Typical changes in the urethra and bladder can be seen with a cystoscope. Injury to other portions of the nervous system due to syphilis gives records of vesical filling typical of the anatomic lesion.

Relationship of Colitis and Proctitis to Lymphopathia Venerea.—Goodman reports that, in a series of twenty unselected cases of proctitis and/or colitis without rectal stricture, seven gave positive Frei reactions. He describes the necroptic aspects of one of these cases. Four additional cases with rectal stricture, as well as colitis, were also found to show positive Frei reactions. The case histories of these eleven patients are given. Two of the patients with stricture were treated with malaria. One patient with stricture and an active amebic dysentery gave a history of draining inguinal sinuses twenty-four years before. One patient with rectal stricture showed an apparent spread of the infection to pelvic viscera, colon, kidney and colostomy opening. The frequency of secondary anemia in patients with rectal and colonic lesions of lymphopathia venerea is pointed out. The evidence for the presence

of the virus in the bowel lesions is reviewed. The necessity for considering lymphopathia venerea in the differential diagnosis of chronic nonspecific ulcerative colitis is emphasized.

Archives of Pathology, Chicago

22: 1-138 (July) 1936

Effect on Monkeys of Small Doses of Concentrated Preparation of Viosterol. E. V. Cowdry and G. H. Scott, St. Louis.—p. 1.
Morphology of Prostatic Corpora Amylacea and Calculi. R. A. Moore, New York.—p. 24.
Chemical Composition of Prostatic Corpora Amylacea and Calculi. R. A. Moore and R. F. Hanzel, Cleveland.—p. 41.
*Protective Action of Sulfhydryl Against Carcinogenesis Induced with 1, 2, 5, 6-Di-Benzanthracene. S. P. Reimann and Edith M. Hall, Philadelphia.—p. 55.
Bronchopulmonary Moniliasis: Its Relation to Obscure Chronic Pulmonary Infection. K. Ikeda, St. Paul.—p. 62.
Experimental Siderosis: III. Spectroscopic Studies of Iron-Containing Pigment. E. Lorenz and V. Menkin, Boston.—p. 82.
*Caisson Disease: Histologic Study of Late Lesions. B. W. Lichtenstein and H. Zeitlin, Chicago.—p. 86.
Importance of Allergy and Immunity Due to Ghon Tubercle in Pathogenesis of Experimental Pulmonary Tuberculosis. B. J. Clawson, Minneapolis.—p. 99.

Protective Action of Sulfhydryl Against Induced Carcinogenesis.—The carcinogenic agent 1,2,5,6-di-benzanthracene and a substance containing the proliferation-stimulating group sulfhydryl parathiocresol, were applied by Reimann and Hall to the skin of mice in various combinations. The incidence of cutaneous tumor was reduced by the action of sulfhydryl. Irritation played no part in the protection. Evidence is adduced to support the following propositions: Stimulation of the rate of cell proliferation alone does not lead to neoplasia; carcinogenesis is caused by damage to the potencies of differentiation and organization; this damage must be transmitted by a cell capable of division or by somatic mutation; when a cell reaches a certain degree of differentiation it can no longer divide and the damage to the potencies of differentiation and organization must occur before potency is determined, at least in cutaneous cells. The previously enunciated definition of tumor is strengthened.

Caisson Disease.—Lichtenstein and Zeitlin point out that paraplegia is only one of the signs observed in men with caisson disease on their return to normal atmospheric pressure. Among the many names used to designate this condition ("diver's palsy," "bends," "compressed air illness" and "caisson disease") the term "aeropathy," suggested by Erdman, is most appropriate, for it signifies the underlying pathogenic factor of the various symptoms incurred in caisson work and in occupations associated with similar hazards. Pleomorphic as the symptoms of caisson disease are, paraplegia is the most striking. Most of the contributions to the pathology of caisson disease in general and to that of the spinal cord involvement in particular have pertained to cases in which the disease was relatively acute. This contribution deals with the changes in the spinal cord of a man who had had the disease for twenty-five years. The authors give the clinical history of this patient and describe the results of the necropsy. The changes outlined can be summed up as ascending and descending degeneration of the spinal cord secondary to a severe destructive lesion of its thoracic portion. The cause of the central nerve lesions in caisson disease is usually considered to be embolism of minute blood vessels, which causes degeneration of all the constituent nerve elements. The authors say that Bassoe classified cases of caisson disease in its late manifestations into three groups: (1) cases in which the spinal symptoms predominate, so-called caisson myelitis, (2) cases in which there is permanent involvement of the joints, and (3) cases in which there is permanent involvement of the ears. They admit that the common occurrence of spastic paraplegia in caisson disease can be explained by the changes in the spinal cord, but they stress that these changes certainly were not inflammatory, in the nature of a myelitis, but degenerative. In answer to the question as to what causes this degeneration, they give their version of the pathogenesis of caisson disease. They state that in chronic combined degeneration of the cord due to aeropathy the thoracic portion of the spinal cord is the site of prevalent involvement, and of this the white matter is much more affected than the gray. The old scars resulting from the embolic occlusion of the capillary blood vessels are exclusively ectodermal and characterized pathologically as anisomorphous gliosis. This condition is best differentiated histologically from multiple sclerosis by detailed study of the areas adjacent to the scars and of those of normal remote regions.

California and Western Medicine, San Francisco

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Sleep Disorders in Clinical Practice. F. G. Ebaugh, Denver.—p. 5.
Present Status of Renal Sympathectomy. T. E. Gibson, San Francisco.—p. 10.
Ocular Syphilis: Its Treatment. H. Barkan, San Francisco.—p. 13.
*Tumors on Spinal Cord: Their Diagnosis, Analysis of Fifty-Nine Cases. O. W. Jones Jr. and H. C. Naffziger, San Francisco.—p. 17.
Pituitary Growth Factor: Some Clinical Considerations. E. K. Shelton, Santa Barbara.—p. 20.
Gunshot Wounds of Abdomen. R. W. Binkley and E. R. Cole, Selma.—p. 26.
Poisoning Poisonous Spiders: Experimental Investigation in Control of Black Widow Spider (Latrodectus Mactans). E. Bogen and R. N. Loomis, Olive View.—p. 31.
Urinary Extravasation. J. C. Negley, Los Angeles.—p. 38.
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*Ruptured Appendix in Children: Its Management. C. J. Baumgartner, Los Angeles.—p. 51.
Latent Syphilis. W. H. Goeckerman, Los Angeles.—p. 55.

Tumors on Spinal Cord.—Jones and Naffziger report that, regardless of the location of the tumor, pain was the most common and usually the initial symptom in their series of fifty-nine cases. It often was present for years before neurologic signs appeared. The pain often simulated that of other disorders, and the patients complained of rheumatism, neuritis, sciatica, lumbago, sacro-iliac strain and abdominal symptoms. In the early stages the pain was invariably localized. In most instances it later developed into a combination of localized and radiating pain. The so-called hour-glass type of tumors have an intraspinal portion connected by a small neck with an extraspinal enlargement. The connection occurred most frequently through an intervertebral foramen but occasionally through an interlaminal space. It is generally accepted that hour-glass tumors are rare, yet there were fifteen such cases in this series. The most important complaint in this group was localized pain. Palpation of the extraspinal portion of the tumor was possible in the cervical region and occasionally in the thoracic and lumbar regions. Roentgenograms of the spine proved extremely valuable. The differential diagnosis between intramedullary tumors and extramedullary intradural tumors is difficult. However, in the extramedullary tumors there was usually a clear-cut history of gradually increasing compression of the spinal cord. In these cases the sensory level was almost always sharply demarcated and tended to be more pronounced in the distal part of the lower extremities than in the higher segments corresponding to the level of the lesion. In the intramedullary tumors the reverse was true; that is, the maximum sensory loss corresponded to the segments of the cord immediately involved, while the sensory alteration in the distal parts of the extremities was not so marked. In addition, in an intramedullary growth sensation tended to fade off above the level of the tumor in a more or less indefinite fashion. Involvement of the conus medullaris by an intramedullary or an extramedullary tumor led, in all instances, to early involvement of the sphincters and varying degrees of impotence. Of the fourteen tumors occurring in the region of the cauda equina, four pathologic types deserve mention: (1) neurofibroma, (2) dislocated nucleus pulposus (chordoma), (3) epidermoid, and (4) large, soft, dural endothelioma. The simplest differential diagnostic test is compression of the jugular and cervical veins. The frequency with which tumors of the conus medullaris and cauda equina simulate orthopedic disorders warrants the recommendation that this test be employed in a routine way in orthopedic examinations in which localized or radicular pain is present. The patient is placed in a comfortable position and, when free from pain, compression of the cervical veins is made as in the Queckenstedt test. As the intracranial and intraspinal pressure above the level of the block is raised, the characteristic pain may be produced if the tumor is capable of being displaced sufficiently to cause traction on or irritation of a nerve root. Although most commonly the pain is reproduced by compression of the jugular and other cervical veins, in certain instances (depending presumably on the direction in which the tumor

dislocates most readily) such pain may be experienced only on sudden release of the jugular compression. Though radicular pain is commoner in cases of tumor of the cauda equina, the value of the test is by no means limited to tumors of this region but has proved of differential value in lesions of various pathologic types involving the cervical and thoracic portions of the spinal cord.

Ruptured Appendix in Children.—Baumgartner maintains that the high incidence of 55 per cent of perforated appendixes in children is due almost entirely to delay. He stresses that the medical profession should repeatedly remind the public of the possible danger of appendicitis in any ordinary so-called stomach ache in children, and persistently warn against the promiscuous use of laxatives before appendicitis has been definitely ruled out. The frequent association of nasal colds, sore throats and middle ear infections is particularly misleading, and parents as well as physicians must realize that their presence with an abdominal pain does not necessarily rule out appendicitis. The use of the continuous dextrose drip in conjunction with the indwelling nasal catheter has been a distinct advance in the postoperative care of these children, not only in that it provides greater comfort, but also in that normal body chemistry is restored and toxins relieved in the quickest possible manner.

Florida Medical Association Journal, Jacksonville

23: 1-60 (July) 1936

Introduction to Medical Economics: II. G. C. Tillman, Gainesville.—p. 11.
Cost of Medical Education. H. L. Pearson, Miami.—p. 13.
Medical Relations Under Workmen's Compensation. O. O. Feaster, St. Petersburg.—p. 15.
Health Insurance. C. D. Christ, Orlando.—p. 18.
Contract Practice. T. H. Bates, Lake City.—p. 20.
Plans for Payment of Medical Care. W. H. Spiers, Orlando.—p. 23.
Health Insurance in England. E. Jelks, Jacksonville.—p. 26.
Health Insurance in Various Parts of the World. T. M. Palmer, Jacksonville.—p. 28.
Defects in Medical Insurance. J. S. Tuberville, Century.—p. 31.
Synopsis and Critical Analysis of Sick Insurance and Cost of Medical Care. J. R. Wells, Daytona Beach.—p. 33.
Layman's Responsibility in Control of Cancer. H. C. Dozier, Ocala.—p. 36.
Mechanics of Circulation. J. R. Wells, Daytona Beach.—p. 38.

Indiana State Medical Assn. Journal, Indianapolis

29: 311-362 (July) 1936

Endocrine Relationship to Etiology of Cancer. N. K. Forster, Hammond.—p. 311.
Jaundice: Its Significance and Implications. J. H. P. Gauss, Indianapolis.—p. 316.
Rupture of Sartorius: Case Report. M. F. Poland, Bloomington.—p. 319.
Bone Sarcoma. R. B. Acker, South Bend.—p. 320.
Obstetrics in Rural Communities. A. E. Burkhardt and B. A. Burkhardt, Tipton.—p. 326.
Medicolegal Problems Arising Out of Injury to the Person. E. R. Smith, Indianapolis.—p. 328.

Journal of Nervous and Mental Disease, New York

84: 1-124 (July) 1936

Reflections on Euthanasia. A. A. Brill, New York.—p. 1.
Neurologic Abnormalities Produced by Electricity. O. R. Langworthy, Baltimore.—p. 13.
*Psychopathology and Treatment of Parkinsonian Syndrome and Other Postencephalitic Sequels. W. Marshall, Appleton, Wis.—p. 27.
Mechanism of Malaria Cure in General Paralysis. G. M. Davidson, Ward's Island, N. Y.—p. 46.
Dynamics of Group Psychotherapy and Its Application. L. Wender, Hastings-on-Hudson, N. Y.—p. 54.
Paralysis of Third Cranial Nerve Due to Spontaneous Hemorrhage within the Nerve in Latter's Intracranial Course. E. S. Gurdjian and L. J. Bailey, Detroit.—p. 61.

Treatment of the Parkinsonian Syndrome.—Marshall endeavored to treat nine cases of postencephalitic sequels with psychotherapy, relaxation and reeducation, with the cooperation of physical and occupational therapy. Psychotherapy was the chief agent in the treatment of these cases. Relaxation and reeducation were very important adjuncts. The realization that patients with the parkinsonian syndrome experience regarding their inability to perform the most simple associated movements throws them into mental conflicts. The retroversion from a highly integrated individual into one of the merest basic functioning is the basis of the emotional upset seen in the disease. In constructing the chain of events that lead to this clinical picture, it is of primary importance to recognize that the pathologic picture is quite a definite entity. Sections of the brain show damage in the subcortical areas. These areas have to do with associated movements. The deprivation of the associated movements in a patient is the basis for the psychoneurotic symptoms, which Haskovec thinks are caused by a subcortical, morbid process. These symptoms are an outgrowth of the inability to coordinate and are on the same basis as a frustration, exemplified by speech defects and behavior problems. Prior to his disease the patient has held a definite position in his own society. However, when he finds himself an invalid, from the point of view of having lost his ability to perform the most simple actions of life, he receives a tremendous psychic shock. The patient realizes his predicament and must cope with these difficulties in some manner. He tries to cover up these defects. This seems to be the basis for the entrance of the so-called psychoneurotic symptoms which these patients show. The patient believes himself to be a cripple, is told that he probably will always be so by the profession and consequently adapts a fitting psychology by beginning to believe earnestly that he cannot overcome his handicaps. Nearly all of the author's patients agreed that they have experienced such a mental attitude. The first step was to establish a "rapport" with the patient. The next step was to effect this by relaxing the contracted parts. Then the process of reeducation or conditioning was tried, that is attempting to supply new habits for the old ones. The psychic factor was of vast importance here, as the patients at first experienced a feeling that they could not execute the exercises because of their physical incapabilities. Continued reassurance and effort, on the part of the attendant, went far in bringing about success in most cases. It was well to convince the patient that the treatment was not a physical impossibility, accomplished by presenting an improved patient to him, at the same time having the former relate how he was prior to treatment. This greatly helped to encourage the patient undergoing treatment and certainly aided in building up his morale. It assisted in bringing about enthusiasm. The patients responded to the method of treatment in such a manner as to warrant further observation and study by other clinicians before any definite statement of encouragement can be given. The author believes that the mental catharsis which most of the patients experienced was responsible for the improvement obtained.

Journal of Urology, Baltimore

36: 1-98 (July) 1936

Reduplication of Renal Pelvis and Ureter. H. S. Everett, Baltimore.—p. 1.
Pyelo-Ureterocystitis Cystica: Case. A. Strachstein, New York.—p. 22.
Treatment of Contracted Bladder with Controlled Tidal Irrigation. J. J. Longacre, Cincinnati.—p. 25.
Spontaneous Rupture of Bladder Associated with Stricture of Urethra. J. A. Lazarus and A. A. Rosenthal, New York.—p. 34.
Transurethral Resection of Large Prostate: Review of 200 Cases in Which 25 Gm. or More of Tissue Was Removed. G. J. Thompson and H. Buchtel, Rochester, Minn.—p. 43.
Treatment of Urinary Lithiasis. J. C. Kimbrough, Fort Sam Houston, Texas.—p. 57.
Experiences with Segmental Peridural Anesthesia in Urology. F. L. Senger and J. J. Bottone, Brooklyn.—p. 71.
Pentothal Sodium Anesthesia in Urologic Practice. R. M. Tovell and G. J. Thompson, Rochester, Minn.—p. 81.
Advances in Field of Cystometry Due to Clinical Studies with Sphincterometer: IV. Studies in Bladder Function: Preliminary Report. I. Simons, New York.—p. 88.

Laryngoscope, St. Louis

46: 493-568 (July) 1936

Antrum Operation: Describing Method Affording Permanent, Adequate Drainage Where Cure of Empyema is Essential. E. C. Sewall, San Francisco.—p. 493.
Complications of Acute Sinusitis with Especial Reference to Bacteremias. J. L. Goldman, New York.—p. 500.
Sphenoiditis with Meningitic Symptoms. R. Kramer and M. L. Som, New York.—p. 507.
Reparative Processes in Labyrinth Secondary to Meningococcus Meningitis: Report of Case. J. G. Druss, New York.—p. 515.
Unusually Early Pleuropulmonary Suppuration in Sinus Thrombosis: Case Report. H. Rosenwasser, New York.—p. 519.
Audiometry and Prescribing of Hearing Aids. I. H. Jones and V. O. Knudsen, Los Angeles.—p. 523.
Periosteal Flap in Performance of Mastoidectomy. H. E. Kully, Omaha.—p. 537.
Nonmalignant Neoplasms of Larynx. G. R. Brighton and S. Daly, New York.—p. 541.
Congenital Stenosis of Larynx. G. H. O'Kane, New York.—p. 550.
Demonstration of New Type of Tracheotomy Tube—Mikell Tracheotomy Tube. J. S. Mikell, New York.—p. 555.
New Nasal and Aural Applicators for Heat Therapy. C. K. Gale, New York.—p. 557.

Michigan State M. Society Journal, Lansing

35: 433-490 (July) 1936

Problems and Trends in Medical Education. R. B. Allen, Detroit. —p. 433.
Treatment of Abortion: Analysis of 646 Cases. C. R. Davis, Detroit. —p. 438.
Tenosynovitis. J. A. Spencer, Flint.—p. 440.
Tonsillectomy. E. W. Teed, Ann Arbor.—p. 445.
Ionization for Nasal Allergy: Experiences and Correlation of Information. S. J. Joyce, Detroit.—p. 447.
Asphyxia as Factor in Paresis: Medicolegal Significance. M. H. Skolnick, Detroit.—p. 455.
Clinicopathologic Conference at Detroit Receiving Hospital: Case of Bronchiogenic Carcinoma, with Clinical and Pathologic Discussion. O. A. Brines and G. B. Myers, Detroit.—p. 457.
Cancer Survey of Michigan. F. L. Rector, New York.—p. 461.

Missouri State Medical Assn. Journal, St. Louis

33: 251-302 (July) 1936

Pathogenesis of Cavernous Sinus Thrombosis. L. A. Scarpellino, P. F. Stookey and F. J. Hall, Kansas City.—p. 251.
Pathology of Silicosis and Silicotuberculosis. W. M. Kinney, Joplin. —p. 257.
Rational Treatment of Sinus Disease. W. B. Black, Kansas City.—p. 260.
Gonorrheal Vaginitis in Children. S. F. Abrams, St. Louis.—p. 263. —p. 695.
Extreme Obesity: Report of Case. C. D. Humberd, Barnard.—p. 265.

New England Journal of Medicine, Boston

215: 1-52 (July 2) 1936

Social Study of Patients with Chronic Cardiac Disease Treated by Total Thyroidectomy. Ethel Cohen and Rosalind L. Herrmann, Boston.—p. 1.
Auscultation of the Abdomen. N. C. Stevens, Walpole, N. H.—p. 22.
Address at Annual Meeting of the Boston City Hospital Alumni Association. S. B. Woodward, Worcester, Mass.—p. 26.
The Progress of Nutrition. F. L. Burnett, Boston.—p. 29.

215: 53-100 (July 9) 1936

Fluid Therapy in Surgery: Critical Review. J. D. Stewart, Boston. —p. 53.
Acute Appendicitis and Measles. H. W. Hudson Jr., Brookline, Mass., and C. Krakower, San Juan, Puerto Rico.—p. 59.
*Simple Method of Oxygen Analysis for Use in Oxygen Tent Therapy. J. E. F. Riseman and G. Lesnick, Boston.—p. 65.
Plurality of Streptococcic Toxins. S. B. Hooker, Boston.—p. 68.
Therapeutics of Drug Habits. A. Lambert, New York.—p. 72.
Advances in Pediatrics. R. C. Eley, Boston.—p. 82.

Simple Method of Oxygen Analysis.—Riseman and Lesnick devised an apparatus to satisfy the need for an instrument which would be accurate, inexpensive and simple enough to operate so that it could be used efficiently without any previous instruction or experience. The simplicity of operation is attested by the fact that nurses and laymen without supervision and with no previous experience with oxygen analysis have experienced no difficulty in using the apparatus for the first time. In principle the method consists of absorbing the oxygen from a known volume of gas and determining the residual volume. The oxygen is absorbed by means of copper gauze and an ammoniacal solution. Sin.plicity of operation is attained by three devices, which result in automatic measuring of the volumes of the sample and the residual gas and in simplified operation of a three way valve. The method yields results that are accurate within 2 per cent.

New Jersey Medical Society Journal, Trenton

33: 385-440 (July) 1936

Some Observations on Blood Pressure. T. A. Smith, Short Hills.—p. 391.
*Treatment of Chronic Heart Disease by Total Thyroidectomy. J. E. F. Riseman, Boston.—p. 397.
Cyanosis in Chemical Plants. E. A. Jirouch, Pennsgrove.—p. 403.
Paying for Medical Care. C. Rufus Rorem, Chicago.—p. 406.
Use of Benzedrine in Eustachian Tube and Middle Ear, with Apparatus for Application. E. L. Wood, Newark.—p. 410.
Postoperative Complications. T. H. Russell, New York.—p. 419.
Penetrating and Nonpenetrating Injuries of Thorax. V. E. Johnson, Atlantic City.—p. 425.

Treatment of Chronic Heart Disease by Total Thyroidectomy.—Riseman says that in two and a half years about 100 patients have been treated by this method at the Beth Israel Hospital in Boston. The author presents the results obtained. He says that the operation confers benefit on a group of cardiac patients who have not been helped by any other method known at present. If the patients are carefully chosen with respect to preoperative basal metabolism and progress of their disease, a satisfactory high percentage of good results can be expected. To keep mortality down and insure a maximum number of good results, the patients must be carefully prepared for operation and the operative technic must be faultless. Finally, the postoperative care of these patients during the months and years they have to live is an extremely important matter and requires careful supervision.

New York State Journal of Medicine, New York

36: 959-1014 (July 1) 1936

Clinical Manifestations of Allergy in the Eyes. A. J. Bedell, Albany. —p. 959.
Sympathetic Nervous System in Its Relation to Peripheral Vascular Disease. E. E. Mack, Syracuse.—p. 967.
Liver and Gallbladder Disease. C. G. Heyd, New York.—p. 974.
Low Back Pain. E. F. Hartung, New York.—p. 979.
Petrositis. C. H. Smith, New York.—p. 983.
Between Mental Health and Mental Disease. B. Liber, New York. —p. 988.

36: 1015-1074 (July 15) 1936

Acute Hemorrhagic Pancreatitis: Causes of—Symptoms and Treatment. D. Lewis, Baltimore.—p. 1015.
Bilateral Pneumothorax Treatment in Pulmonary Tuberculosis: Simultaneous Applicability in Ambulatory Cases. R. A. Bendove, New York.—p. 1020.
Selective Tests Used in Industry to Measure Specific Abilities and Aptitudes. M. Lake, New York.—p. 1025.
Chronic Arsenic Poisoning in a Child Associated with Profound Anemia and Scleroderma: Case. L. Mary Moench, New York.—p. 1029.
The Practicability and Significance of Blood Iodine Estimations. H. J. Perkin and R. B. Cattell, Boston.—p. 1033.

Northwest Medicine, Seattle

35: 243-284 (July) 1936

One Hundred Years of Medicine in Oregon. O. Larsell, Portland, Ore. —p. 243.
Marcus Whitman, Pioneer Physician. S. J. Newsom, Walla Walla, Wash.—p. 250.
*Stokes-Adams Syndrome Following Influenza. L. M. Mares, Wenatchee, Wash.—p. 252.
Pitfalls in Surgery of Acute Abdomen. R. C. Schaeffer, Tacoma, Wash. —p. 255.
Contrast Between General Surgery of Infants and Children and That of Adults. C. W. Brunkow, Portland, Ore.—p. 259.
Proprietary Medicine Evil. E. D. Johnson, Klamath Falls, Ore.—p. 263.
Hydrocele of Canal of Nuck: Report of Case and Discussion of Inguinal Hernia. J. K. Holloway, Seattle.—p. 264.
*Initial Cold Water Treatment for Burns. H. W. Rose, Seattle.—p. 267.

Stokes-Adams Syndrome Following Influenza.—Mares says that the attending physician should watch for signs of cardiac damage in influenza. That the influenza is running a mild course is no guaranty against involvement of the heart. The heart complications are usually of late appearance, after the fever has run its course and often after convalescence is well advanced. They may not be recognized till they appear as late sequels, months after the influenza. Furthermore, it is probable that many cases of myocardial disease are attributable to influenza dating back for a period of years, just as is the case with rheumatic fever. Complete heart block is a relatively rare complication of influenza, and the Stokes-Adams syndrome is still more exceptional. But a slow pulse has been noted as a fairly frequent accompaniment of influenzal infection, for which various explanations have been advanced: toxic inhibition of the impulse-forming activity of the sinus node, vagal excitation, dromotropic disturbances and causes outside the heart. The fact that the pulse disturbances sometimes appear long after the illness shows that they must have some other basis than the physical and psychic prostration that are such well known features of convalescence from influenza. The cases occurring during convalescence would seem to find adequate explanation in toxic injury either to the vagus, with stimulation of its inhibitory influence on the heart action, or to the conduction pathway in the myocardium, with interruption of impulses from the auricle to the ventricle. In either case the blood supply to the brain would be temporarily cut off, with syncope as the natural consequence. The author reports the history of a man, aged 29, whom he saw during an influenza epidemic and who complained of "dizzy spells." Following the third attack he was brought to the hospital. During the next twenty-four hours he had eight paroxysms which gradually decreased in severity. He was given atropine, one one-hundredth grain (0.00065 Gm.) every four hours, along with barium chloride, two-thirds grain (0.04 Gm.) every six hours.

After thirty-six hours the pulse rate gradually increased and the atropine was omitted. During his hospitalization, two-thirds grain doses of barium chloride were given four times a day. On his discharge, this was continued in two-thirds grain doses three times daily, and at the end of the fourth week his pulse remained at 70. The barium chloride was discontinued at this time. Two weeks later the pulse rate was maintained at sixty-eight, with no recurrent symptoms.

Initial Cold Water Treatment for Burns.—When Rose sees the patient soon after the accident, he applies cold water to the burned tissue after as much clothing as possible has been removed. Ordinary tap water is used. In the case of small burned areas or a part of a single extremity, cold wet dressings are applied or the parts submerged in basins containing cold water. In the case of extensive burns, the patients are placed in a tub. The immediate results are favorable. Patients with severe pain are relieved within a few seconds without the use of an opiate. Patients in early shock often respond promptly with no other measures, the weak and feeble pulse becoming slower and stronger, the blood pressure rising and the patient's color resuming a normal appearance. A burn involving one half of the body surface has usually been regarded as fatal, and the fatal outcome is the result primarily of the shock. "The primary phase" of shock is due to the pain of the direct nerve injury, with its resultant reflex vasodilatation. The more important type of shock, however, is the so-called secondary shock, which is due to loss of fluids from the circulating blood. If some time has elapsed before the patient is first seen, so that the state of shock is rather far advanced, other shock therapy is started in addition to the cool water. Fluids by mouth are given immediately, and a transfusion of blood is started while the patient is still in the tub. If a donor is not avaliable, intravenous acacia is used. For the next two hours this treatment is continued. During this time the water is gradually warmed, as rapidly as the pain sensations of the patient will permit. The temperature of the water at first is between 60 and 70 F. At the beginning of the third hour it is about 98 F. At this time one-fourth grain (0.016 Gm.) of morphine is usually given, preparatory to the mild débridement to follow. About half an hour later remaining pieces of clothing are removed, dead tissue and dirt are wiped away with gauze, and blebs are opened. If much dirt and grease are present, the body is scrubbed from head to foot with sterile soap and water. After the burned areas and body are clean, the patient is rinsed with sterile water and dried with warm air from an ordinary hair drier. The patient is then placed on a sterile sheet on the bed and is ready for Bettman's tannic acid and silver nitrate treatment or the ferric chloride coagulation method described by Coan.

Ohio State Medical Journal, Columbus

32: 601-700 (July 1) 1936

Traumatic Diaphragmatic Hernia. B. N. Carter, Cincinnati.—p. 617.
*Study of Postdelivery Deaths Caused by Embolism. C. T. Hemmings, Cleveland.—p. 620.
Critical Analysis of Diagnosis and Surgical Treatment of Thyroid Conditions. N. W. Gillette, Toledo.—p. 627.
Diagnosis and Treatment of Pulmonary Tumors. S. Brown, Cincinnati.—p. 630.
Basic Principles in the Management of Myopias. I. G. Clark, Columbus.—p. 634.
Acute Monocytic (Histiocytic) Leukemia. T. L. Ramsey and R. A. Tank, Toledo.—p. 637.
New and Approved Methods of Combating Tuberculosis. T. L. Bliss, Akron.—p. 642.
Malaria Treatment in Congenital Syphilis. R. A. Kidd Jr., Columbus.—p. 645.
Essential Operations for Chronic Ulcerative Colitis. J. A. Bargen and C. F. Dixon, Rochester, Minn.—p. 650.
Removal of Plaster Cast from Within Out: New Method. W. M. Hayes, Hamilton.—p. 653.

Postdelivery Deaths Caused by Embolism.—Hemmings found the total incidence of postdelivery embolism in a series of 80,136 births to be 0.04 per cent. Postdelivery embolism presented an incidence of 7.8 per cent of the total deaths and 14.5 per cent of the delivery deaths. The incidence of postdelivery embolism was more than three times greater when operative intervention was used than in normal deliveries. Cesarean section rated second in incidence of all operative procedures. The mortality rate was highest between the ages of 26 and 30 years. Adequate antepartum care did not prevent embolism in 78 per cent of the series. The average duration of labor in all cases was sixteen and a half hours. The most frequent causative factors were hemorrhage, trauma, infection and venous stasis. Available blood counts generally revealed a well marked secondary anemia. Symptoms of phlebitis were present in only 24.3 per cent of the patients. The medication used had no direct bearing on the causation of embolism. In order to improve the understanding and knowledge of postdelivery thrombosis and embolism, necropsies performed by obstetrically minded pathologists should be insisted on.

Oklahoma State Medical Assn. Journal, McAlester

29: 239-272 (July) 1936

Diagnosis and Treatment of Malignant Diseases of Mouth. P. B. Champlin, Enid.—p. 239.
Study of Altered Kidney Position and Its Correction. R. H. Akin, Oklahoma City.—p. 242.
Precancerous Lesions of Skin. D. G. Duncan, Oklahoma City.—p. 245.
Mastoiditis in Malnourished Infants. C. H. Hall, Oklahoma City.—p. 247.
Pulmonary Complications Which Frequently Follow Abdominal Surgery. W. P. Neilson, Enid.—p. 250.
Paraldehyde in Obstetric Analgesia. E. E. Rice, Shawnee.—p. 252.

Pennsylvania Medical Journal, Harrisburg

39: 665-754 (June) 1936

Cancer of the Prostate. H. G. Bugbee, New York.—p. 665.
The Heart in Toxic Goiter. H. L. Foss, Danville.—p. 671.
The Physician-Patient Relationship. E. L. Bortz, Philadelphia.—p. 681.
Recent Advances in Bronchoscopy of Children. C. Jackson, Philadelphia.—p. 685.
Varicose Veins: Evaluation of Injection Treatment. W. M. Kunkel, Harrisburg.—p. 687.
Patch Test in Determination of Arsphenamine Sensitization. H. Beerman, Philadelphia.—p. 690.
Lower Third Forearm and Leg Fractures. F. W. Heyer, Nanticoke.—p. 695.
Urinary Hemorrhage: Symptom, Not a Disease, with Particular Reference to Importance of Early Diagnosis of Bladder Tumors. E. Hess, Erie.—p. 698.
Diabetes and Pregnancy: Survey of 665 Cases. D. W. Kramer, Philadelphia.—p. 702.
Pediatric Therapeutics. H. H. Perlman, Philadelphia.—p. 707.

Public Health Reports, Washington, D. C.

51: 897-946 (July 10) 1936

History and Frequency of Typhoid Fever Immunizations and Cases in 9,000 Families: Based on Nation Wide Periodic Canvasses, 1928-1931. S. D. Collins.—p. 897.
Postmortem Findings in Fatalities Due to Use of Arsphenamine Group: Review of Forty-Four Autopsies. S. S. Cook.—p. 927.

Southwestern Medicine, Phoenix, Ariz.

20: 247-286 (July) 1936

Our Ethics: President's Address. M. B. Culpepper, Carlsbad, N. M.—p. 247.
Problems of Crying Infant. J. R. Lemmon, Amarillo, Texas.—p. 248.
Pathology of Peptic Ulcer. W. W. Waite, El Paso, Texas.—p. 250.
"Filtrate" Treatment of Acute Gonorrhea: Case Reports. W. R. Jamieson, El Paso, Texas.—p. 251.
*Acute Gastro-Intestinal Allergy Mimic of Surgical Abdomen. L. O. Dutton, El Paso, Texas.—p. 252.
Primary Infection, Allergy, and Reinfection in Tuberculosis of Children. B. P. Storts, Tucson, Ariz.—p. 255.
Surgical Treatment of Pulmonary Tuberculosis. C. A. Thomas and S. C. Davis, Tucson, Ariz.—p. 257.
Diagnosis of Early Tuberculosis. V. S. Randolph, Phoenix, Ariz.—p. 260.
Suggested Improvements in Thoracoplasty. W. Smith, Phoenix, Ariz.—p. 263.
Sheep Cell Agglutination in Diagnosis of Infectious Mononucleosis. L. B. Baldwin, Tucson, Ariz.—p. 266.
Surgical Management of Duodenal Ulcer. J. W. Hendrick, Amarillo, Texas.—p. 269.
Medical Annals of Arizona: Health Among the Navajos. S. J. Tillim, Amityville, N. Y.—p. 273.
Public Health Notes. J. R. Earp, Santa Fe, N. M.—p. 276.

Acute Gastro-Intestinal Allergy.—Dutton thinks that failure to consider allergy in differential diagnosis is particularly common in the field of abdominal surgery. In studies that he conducted in order to determine how innocent appearing appendixes can cause symptoms sufficiently grave to bring patients to the operating table, he detected two factors, which he at first did not appreciate. They were edema and eosinophilic infiltration. However, the significance of eosinophilia in allergic reactions in other tissues became established about this time.

The author studied this field, but it became at once apparent that allergy alone would not explain all the facts observed. Many appendixes with an eosinophilic infiltration also presented definite evidence of infection. When the histories of these patients were studied, the conception of the interrelationship of allergy and infection agreed. It is the author's present belief that either infection or an allergic reaction may initiate symptoms referable to the appendix or other tissues and that the allergic reaction is more frequently the first. It is also his conviction that many appendixes are removed before infection develops. He believes that proper attention to the allergic phase might bring relief to many patients without operations. Many patients are not relieved by surgery. He lists some of the symptoms that have been proved to be definitely caused by allergic reactions to foods: canker sore, coated tongue, heavy breath, distention, belching, epigastric heaviness, sour stomach, burning, pyrosis, nausea, vomiting, diarrhea, mucous colitis, constipation, "gas in the bowels," pruritus ani, pain and soreness in the epigastrium, colonic soreness and the ulcer type of pain. General symptoms are toxicity, weakness, irritability, nervousness, mental dulness and depression, general aching, fever and so on. From this list it is apparent that certain abdominal symptoms might easily be interpreted as acute or chronic appendicitis, ulcer, cholecystitis, cholelithiasis, renal colic or even, in extreme cases, obstruction. Of 150 cases in which these symptoms had appeared, operations had been performed in forty-seven without permanent relief. A diagnosis depends on a careful history, including the allergic history, and a careful physical examination and blood study, weight being given to those slight variations caused by allergy. The treatment is symptomatic—epinephrine, ephedrine and opiates; fundamental—diet along allergic lines, and surgical intervention if necessary.

Tennessee State Medical Assn. Journal, Nashville

29: 253-294 (July) 1936

Afebrile Exhaustive Psychosis Following Sickness. J. C. Hill, Knoxville.—p. 253.
Practical Suggestions Concerning Orthoptic Treatment of Concomitant Squint. Lillian H. Tepper and R. O. Rychener, Memphis.—p. 258.
"Congenital Atresia of Vagina." W. B. Barton, Briceville.—p. 267.
Edema. J. B. Youmans, Nashville.—p. 270.
Bronchial Asthma. W. C. Chaney, Memphis.—p. 276.
Catheters. J. C. Pennington and E. C. Lowry, Nashville.—p. 280.

Texas State Journal of Medicine, Fort Worth

32: 199-258 (July) 1936

Shall Medicine Be Socialized? H. R. Dudgeon, Waco.—p. 205.
Prevention and Treatment of Scarlet Fever. J. E. Dunlap, Dallas.—p. 208.
Prevention and Treatment of Measles. R. L. Moore, Dallas.—p. 212.
Prevention and Treatment of Poliomyelitis: A Résumé. P. E. Luecke, Dallas.—p. 216.
Prevention and Treatment of Whooping Cough. G. B. McFarland, Dallas.—p. 219.
Treatment of Enlarged Prostate Gland by Modern Methods. C. H. Mayo, Rochester, Minn.—p. 221.
Injection Treatment of Hernia. P. Riddle, Dallas.—p. 226.
Nonspecific Granuloma of Gastro-Intestinal Tract. C. B. Sanders, Dallas.—p. 230.
Urinary Calculi. G. J. Thompson, Rochester, Minn.—p. 234.
*Radiation Therapy of Lobar Pneumonia. E. V. Powell, Temple.—p. 237.

Radiation Therapy of Lobar Pneumonia.—Powell reports a series of forty-seven cases of lobar pneumonia in which, in addition to the other usual methods of treatment, roentgen therapy has been given. In this series only one patient died, whereas of seventy-six patients admitted immediately preceding and during the early part of this series, who received in general the same treatment except that they were not irradiated, twenty-two died. Ten of the case histories are abstracted to illustrate individual reactions. Perhaps the most impressive thing in observing the patient is the marked relief of discomfort and the promptness with which a number of the patients developed crises. Treatment of bronchopneumonia is discussed very briefly. Conclusions are hardly warranted until a larger number of cases have been observed; however, the author thinks that a mortality of less than 2.5 per cent in lobar pneumonia and only 14 per cent in all types of pneumonia, in which roentgen therapy was administered during the past forty months, warrants continued use of the method unless some practical contraindication can be demonstrated.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 1285-1332 (June 27) 1936

*Psychologic Factors in Asthma. R. D. Gillespie.—p. 1285.
Lister's Straight Bougies in Treatment of Urethral Stricture. G. H. Edington.—p. 1289.
Age Incidence and Sex Incidence of Milk-Borne Epidemics. R. M. F. Picken.—p. 1291.
Nasal Obstruction in the New-Born. A. Moncrieff.—p. 1295.
Hemochromatosis: Report on Three Cases. R. M. M. Lyon.—p. 1297.
Drainage of Maxillary Sinus: New Technic. A. Miller.—p. 1299.

Psychologic Factors in Asthma.—Gillespie believes that asthma furnishes a striking text of what needs to be emphasized in the education of medical students: that the body and the mind are one, or at least that their interaction is so close that no examination of a patient should neglect some consideration of what is going on in his mind. There is evidence that a stock in which asthma occurs is often also one in which there is a high incidence of psychoneurotic manifestations: as if the asthma and the psychoneurotic constitution were closely allied. The function of breathing is very much subject to emotional influences in everybody. Numerous studies of respiration curves have demonstrated objectively the close relationship between emotional stimuli, or states of mind, and the respiratory function. The physiologic mechanism of asthmatic attacks seems to involve among other things a disturbance in what is usually called the vagosympathetic "balance," which is very much influenced by emotional states. Every emotion tends to be propagated like a wave of physiologic disturbance through the vagal and sympathetic system to the viscera. If there is already existing some disturbance of the vagosympathetic, clearly the emotional disturbance will have unusual effects, and asthma may be one of them. Psychologic stimuli can be equipotent with physical ones in producing signs and symptoms of physical disease. An idea may become the effective stimulus which elicits the asthmatic response just as much as pollen or horsehair. Not only may psychologic factors in the shape of emotions or ideas elicit individual attacks, but they may act in continuing fashion to produce a state of tension which every now and then may reach explosion point and express itself in an asthmatic paroxysm. The choice of asthma as the special mode of expression of mental unrest, whether the latter takes a psychoneurotic form or not, depends (1) on constitution, accident, preexisting fear of lung disease, preexisting disease of the lungs, a conception of breathlessness or an imitation of asthmatic attacks which the patient has witnessed, or something akin to them. This can apparently be a factor in determining the expression of the psychoneurosis in this particular way. The most obvious type of relationship between asthma and psychologic conditions is the frequency with which asthmatic patients exhibit what would be called a neurotic type of personality long before an asthmatic attack began.

Edinburgh Medical Journal

43: 349-416 (June) 1936

Clinical Recollections and Reflections: III. Pediatric Surgery in General Practice. J. Fraser.—p. 349.
*Treatment of Disseminated Sclerosis as Deficiency Disease: Study of Fifty Cases. A. Goodall and J. K. Slater.—p. 368.
Intestinal Obstruction: Results of Recent Experiment Applied to Clinical Practice. I. Aird.—p. 375.
Rôle of Luteal Hormone in Maintenance of Gestation. J. M. Robson.—p. 395.
Investigation into Sterility of Droitwich Brine, and Its Bactericidal Action. F. I. Dawson and H. B. Salt.—p. 402.

Treatment of Disseminated Sclerosis as Deficiency Disease.—In treating fifty cases of disseminated sclerosis, Goodall and Slater advised half a pound of liver two or three times a week and prescribed in addition a diet of eggs, milk, fresh vegetables and fruit. The cereals were greatly restricted or cut out altogether. Potatoes and tomatoes are efficient substitutes. No other restriction of diet was made. In other directions, patients are encouraged to carry on their ordinary avocation as far as possible. None of the "advanced" cases in the series had reached the stage of contractures and bed sores. A feature of most cases is the early change in the

degree or rate of nystagmus, with its frequent entire disappearance. There has been only one relapse in a patient who has begun to improve and has kept to the diet. Owing to the different classes of case and the differences in observation period, no general statement of numbers improved or worse is made, but the nine patients with disseminated sclerosis of a duration less than one year are at work and six of them have been observed from two to five years. Of the nine with a duration of from one to two years, six are known to be working and all had improved when last seen.

Journal of Hygiene, London

36: 129-268 (June) 1936

*Nasal Diphtheria Carriers. G. de M. Rudolf and W. R. Ashby.—p. 129.
Incidence and Clinical Correlation of Types of Corynebacterium Diphtheriae at Romford, Essex: Survey of 400 Cases. R. W. Tannahill.—p. 140.
Further Analysis of Types of Corynebacterium Diphtheriae Common to Glasgow Area. H. S. Carter.—p. 147.
Naturally Acquired Tuberculosis in Various Animals: Some Unusual Cases. A. S. Griffith.—p. 156.
Statistical Examination of Significance and Comparative Value of Milk Agar for Raw and Pasteurized Milk. H. Barkworth.—p. 169.
Influence of Raw and Sterilized Milk on Growth and Reproduction in Rats. Hilda Alice Channon and H. J. Channon.—p. 173.
Studies on Endemic and Experimental Goiter. C. E. Hercus and H. D. Purves.—p. 182.
Further Investigations on Nature of Ultramicroscopic Viruses and Their Cultivation. F. W. Twort.—p. 204.
*Study of Incidence of Cancer of Lung and Larynx. N. M. Kennaway and E. L. Kennaway.—p. 236.

Nasal Diphtheria Carriers.—Rudolf and Ashby studied sixty-two adult male carriers of morphologic Bacillus diphtheriae occurring in an institution. No cases of clinical diphtheria developed, although tests demonstrated that many of the cultures were virulent to guinea-pigs. Others were avirulent. Nasal swabs were collected at irregular intervals and were continued until three successive negative specimens had been obtained from each patient. The patients were isolated and treated with gargles of physiologic solution of sodium chloride and the sniffing of solution of sodium chloride up the nose three times a day. The investigation is based on the hypothesis of a constant probability of obtaining a positive swab under these conditions of treatment. With this treatment the majority of the patients were carriers for periods of less than nine days. Two successive negative swabs were followed by positive results in twenty-two cases. In order to recognize 99 per cent of the carriers in a population receiving treatment with physiologic solution of sodium chloride, five swabs are required from each person examined.

Incidence of Cancer of Lung and Larynx.—The Kennaways examined the 18,280 death certificates for cancer of the lung and of the larynx in males from England and Wales for the years 1921 to 1932 inclusive. Necropsies have been made in about 28 per cent of the cases of cancer of the lung and 9 per cent of the cases of cancer of the larynx. The agricultural and coal mining industries show a low incidence of cancer of the lung and of the larynx. The factors that lead to silicosis appear not to be very active in producing cancer of the lung or larynx, but in metal grinders the incidence of cancer of the lung is two and one-fourth times that in the general population. A group of open air occupations, in which there is exposure to the dust of roads, have rather high ratios for cancer of the lung and of the larynx, with the exception that motor drivers have a normal liability to cancer of the larynx. No cases of cancer of the lung in asbestos workers have been found among the certificates considered. Workers exposed to coal gas and tar, and those engaged in the preparation and sale of tobacco, tend to show an increased prevalence of cancer of the lung. Occupations concerned with the supply of alcohol have a high incidence of cancer of the larynx. The greater incidence of cancer of the lung in men than in women is discussed. The recent rate of increase of cancer of the lung in men is found to be not much greater than that in women, when these increases are reckoned in percentages. The increase in recorded cases of cancer of the lung may be due to an actual increase, improvement in diagnosis, fashion in diagnosis or any combination of these factors. The number of deaths attributed to cancer of the prostate appears to have reached a steady level. No special occupations have been found to which the increase in the total of cases of cancer of the lung can be attributed; rural workers show an increase which is not much less than that in the general population. No evidence has been found that tarring of roads has affected the incidence of cancer of the lung in the general population. Such data as are available suggest that coal tar in the atmosphere, whether derived from roads, domestic chimneys or any other source, does not readily give rise to cancer of the lung. Cotton-mule spinners show an especially small liability to cancer of the lung, although they inhale air sprayed with an oil which produces cancer of the skin. Improvements in diagnosis must have led to the detection of a larger proportion of the existing cases of cancer of the lung.

Journal of Physiology, London

87: 1-96 (June 10) 1936

Responses of Normal and Hypophysectomized Rabbits to Adrenalin. C. Bachman and G. Toby.—p. 1.
Certain Effects of Pulmonary Gas Embolism. I. Singh.—p. 11.
Breakdown of Color Match with High Intensities of Adaptation. W. D. Wright.—p. 23.
Duodenum and Automatic Control of Gastric Acidity. W. J. Griffiths.—p. 34.
*Acclimatization of Human Subject to Atmospheres Containing Low Concentrations of Carbon Monoxide. Esther M. Killick.—p. 41.
Oxygen Consumption and Carbohydrate Metabolism of Retractor Muscle of Foot of Mytilus Edulis. Deborah Glaister and Margaret Kerly.—p. 56.
Excitability of Sensory Fibers in Maia Nerve. J. Y. Bogue and H. Rosenberg.—p. 67.
Some Observations on Genesis of Somatic Movements in Sheep Embryos. J. Barcroft, D. H. Barron and W. F. Windle.—p. 73.
Chemical Transmitter of Motor Impulses to Stomach. J. S. Harrison and B. A. McSwiney.—p. 79.
Further Studies on Reactions of Abdominal Vena Cava. K. J. Franklin and A. D. McLachlin.—p. 87.

Acclimatization to Atmospheres with Low Carbon Monoxide.—Killick attempted to produce acclimatization in the human subject by repeated exposure to atmospheres containing low concentrations of carbon monoxide and by repeated inhalations of carbon monoxide from a closed respiratory circuit. Clear evidence of a considerable degree of acclimatization was obtained in that symptoms of poisoning lessened during successive exposures to the same concentration of carbon monoxide and the relation between the concentration of carbon monoxide breathed and the degree of saturation of the blood changed with repeated exposures. Acclimatization was not accompanied by changes in the red cell count or in the hemoglobin content of the blood. The data obtained were insufficient to justify a statement as to changes in blood volume. The partition constant between oxygen and carbon monoxide of whole blood outside the body remained unaltered as acclimatization developed. The state of acclimatization produced experimentally lasted from thirteen to eighteen months, diminishing gradually in degree until the subject returned to the nonacclimatized state after eighteen months. The two possible types of explanation for the phenomena of acclimatization are (1) a selective activity of the alveolar membrane producing either a secretion of oxygen from the alveoli into the blood or an excretion of carbon monoxide from the blood into the alveoli; (2) removal of carbon monoxide from the blood by oxidative or other processes in the tissues.

Journal of State Medicine, London

44: 373-434 (July) 1936

The Clamant Call for Changes in Medical Education. D. C. Watson.—p. 373.
The Housing Act, 1935. G. E. Oates.—p. 384.
Nutrition as Factor in Pregnancy and Childbirth. M. I. Balfour.—p. 391.
The Prognosis of Early Pulmonary Tuberculosis. J. B. Alexander.—p. 402.
The Prognosis of Pulmonary Tuberculosis, with Especial Reference to Collapse Therapy. G. S. Todd.—p. 410.
Public Health Administration in Bermondsey (Past and Present). D. M. Connan.—p. 414.

Journal of Tropical Medicine and Hygiene, London

39: 137-148 (June 15) 1936

Some Observations on Opuntia Used as a Larvicide. F. G. Cawston.—p. 137.
Hyrax and Dikdiks (Rhynchotragus) from Areas Inhabited by Tsetse Flies: Note. J. F. Corson.—p. 138.

Lancet, London

1: 1337-1390 (June 13) 1936

Enlargement of the Heart. J. Parkinson.—p. 1337.
Treatment of Anorectal Wounds. W. B. Gabriel.—p. 1345.
The Initial State Principle and Its Importance in Physiology and Pathology. S. Leites.—p. 1348.
The Problem of Repair and Regeneration of Semilunar Cartilages. A. G. T. Fisher.—p. 1351.
Histidine in Treatment of Gastric and Duodenal Ulcer. R. H. Gardiner. —p. 1352.
*Weight of Thyroid Gland and Atherosclerosis. N. P. Dungal.—p. 1354.

Weight of Thyroid Gland and Atherosclerosis.—Although his material is not extensive, it is evident to Dungal that the Icelandic population has an unusually small thyroid and an unusually low rate of atherosclerosis of the aorta. Atherosclerosis of other arteries is also relatively rare. The question arises whether there is a causative relationship between the small thyroid (14.9 Gm. for males and 11.3 Gm. for females) and the low rate of sclerosis. Experimentally atherosclerosis can be produced, in rabbits, by injection of epinephrine (Josué) and by feeding viosterol. Liebig administered a diiodide of castor oil stearate having an iodine content of 116 per cent to rabbits during the feeding with cholesterol and thereby prevented or diminished atheromatosis in the aorta and the liver. Binet has shown that potassium iodide and albumin iodine have the same effect. Murata has shown that atheromatosis may be prevented in rabbits by feeding a thyroid substance. On the other hand, Pusch has shown that arteriosclerosis is four times as frequent with goiters as with nongoitrous glands. Probably the explanation for these conditions in Iceland is the abundance of iodine in the food, particularly the fish, which is consumed in relatively great amounts, but partly also by the iodine in air and soil, which probably is great. The Icelandic people range high in physical and mental powers. The question arises whether the normal weight of the thyroid is not lower than that generally accepted, and whether a low degree of iodine deficiency is not more widespread than it is thought to be.

Medical Journal of Australia, Sydney

1: 771-802 (June 6) 1936

Obstetrical Obstacles. H. S. Waters.—p. 771.
Evolutionary Factor in Parturition: Law of Split Pelvis. C. D. Gillies. —p. 778.
*O Agglutinins for Bacillus Proteus XK in Endemic Typhus. R. Y. Mathew.—p. 782.
Surgery at Sea in the Eighties. R. S. Skirving.—p. 783.
Preliminary Treatment in Relation to Therapeutic Irradiation of Mouse Tumors. W. Moppett.—p. 785.

O Agglutinins for Bacillus Proteus XK.—Mathew says that, in recent papers on the endemic typhus of the eastern coastal areas of North Queensland by Langan and Mathew and Unwin, positive agglutination reactions with the Kingsbury strain of Bacillus proteus X were quoted in confirmation of the diagnosis. In the earlier tests recorded in these papers only living suspensions of Bacillus proteus X19 and Bacillus proteus X Kingsbury were used; later check tests were made with heated suspensions. The author succeeded in checking the tests further with suspensions recommended by Felix and in demonstrating that the agglutinations in these and subsequent cases are of the O type. He lists the suspensions used in the tests and describes the preparation of the suspensions, the methods of testing and the results of the agglutination tests. In summarizing his observations, he states that O agglutinins for the Kingsbury strain of Bacillus proteus X are shown to be present in high titer in cases of one of the classes of endemic typhus in the eastern coastal area of North Queensland. It is also shown that both O and H agglutinins for the X19, X2 and XL strains of Bacillus proteus are not present in significant amounts.

Practitioner, London

137: 1-128 (July) 1936

Endocrines and Mental Disorders. W. Langdon-Brown.—p. 1.
Classification and Etiology of Neuroses. H. Crichton-Miller.—p. 14.
Early Symptoms of Mental Disorders. R. D. Gillespie.—p. 25.
Physical Factor in Mental Disorder. J. G. P. Phillips.—p. 36.
Depression. W. R. Reynell.—p. 49.
Dementia Praecox. D. F. Rambaut.—p. 70.
Drug Addiction and Alcoholism. J. Purves-Stewart.—p. 79.
Sexual Perversions. J. R. Rees.—p. 98.
General Practice: No. I. Preparation for Practice. A. H. Douthwaite. —p. 108.

Archives des Maladies de l'Appareil Digestif, Paris

26: 625-768 (June) 1936

Chronic Paralytic Duodenal Stasis. J. Ducuing and P. Fabre.—p. 625.
Icterus Following Mercurial Medications. M. Vauthey.—p. 652.
Intestinal Parasitism in Healthy Children. F. Fernandez.—p. 665.
"Sugar Days" in Treatment of Liver and Biliary Tract Disorders. L. B. Berlin, W. Z. Koudachewitch, S. T. Granat, D. I. Pawloff and E. I. Altschuler.—p. 674.
*Shock Produced by Homogenous and Heterogenous Blood as Therapeutic Method in Treatment of Enterocolitis. S. Ryss, X. Stroikova and V. Vedensky.—p. 685.
Place of Mucus in Gastric Pathology. J. M. González Galvan.—p. 697.
Treatment of Gastroduodenal Ulcer and Simple Hyperchlorhydria by Injections of Pepsin. S. Livierato and A. Simoneto.—p. 706.
Correlations Between Secretion of Gastric and Pancreatic Glands. I. M. Lipetz.—p. 717.
Hepatitis and Gastritis. L. S. Schwartz and M. X. Krinsky.—p. 731.

Blood Transfusion in Treatment of Colitis.—Ryss and his co-workers report forty cases of enterocolitis and colitis in which treatment was administered by means of transfusion of blood. Nineteen of the patients were treated with homogenous blood, nineteen by heterogenous and ten by combinations of the two. As heterogenous blood the citrated arterial blood of the dog was introduced intravenously in doses of 5, 10 and 12 cc. at intervals of from eight to ten days. Three injections usually were sufficient for obtaining the desired effect. As homogenous blood, from 250 to 300 cc. of fresh citrated or preserved blood of the same grouping was introduced at intervals of from eight to ten days. The patients, in good general health up to the age of 45 and with an approximately normal blood picture, could be treated with the heterogenous blood. In all, 126 heterogenous and fifty-nine homogenous transfusions were given. The heterogenous transfusions produced more frequent and more intense reactions, the local manifestations lasting from a few hours to several days. There was some reaction in 71.4 per cent of those receiving heterogenous and in 49.7 per cent of those receiving homogenous blood. From the clinical standpoint a marked improvement of the subjective phenomena associated with rapid increase in weight, increased erythropoiesis and improved susceptibility to specific therapy were noted. Improvements from homogenous transfusions occurred in 94.8 per cent and in the heterogenous transfusions in 90.9 per cent. When the combined method was used, some improvement was noted in all patients. As a result of these studies the authors believe that, depending on the status of the patient, one or both of these methods of transfusion is an important therapeutic measure in the treatment of diseases of this group.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

52: 983-1030 (June 22) 1936

Spontaneous and Benign Hemopneumothorax. J. Troisier, M. Bariéty and Dugas.—p. 984.
Acute Aleukemic Leukosis with Pseudorheumatismal Symptomatology. R. Debré, M. Lamy, P. Soulié and P. Gabriel.—p. 991.
Kala-Azar Observed at Several Years' Interval in Same Family: Three Cases. P. Giraud and Caillol.—p. 997.
Renal Intolerance of Lipoid Nephrosis Type Five Weeks After Series of Bismuth Salt. A. Tzanck, P. Klotz and A. Negreanu.—p. 1000.
Intoxication by Aniline with Intense Cyanosis. M. Loeper, P. Soulié and Marchon.—p. 1003.
*Diagnosis of Hodgkin's Disease by Lymph Node Puncture. P. Emile-Weill, P. Isch-Wall and S. Perlès.—p. 1006.
Cerebral Angiospasm: Case. A. Germain and A. Morvan.—p. 1010.
Diabetes and Acute Articular Rheumatism. R. Waitz and R. Pernot. —p. 1013.
Parkinsonian Syndrome of Syphilitic Nature. C. I. Urechia and Mme. Retezeanu.—p. 1018.

Diagnosis of Hodgkin's Disease.—Because of the frequent difficulty encountered in performing biopsies in the early stages of Hodgkin's disease, Emile-Weill and his associates decided to attempt lymph node puncture. They were able to verify their observations of the accuracy of this method on twenty patients controlled by biopsy. In each case the results of the puncture coincided accurately with that of the adenectomy. The principal diagnostic criteria observed in the slides made from these punctures were endothelial elements and authentic giant cells of Sternberg. They believe that the latter elements are pathognomonic of malignant lymphogranulomatosis and that a method of lymph node puncture can be satisfactorily substituted for the more arduous and less practical biopsy.

Journal de Médecine de Lyon

17: 427-454 (June 20) 1936

Chemical Influences in Neurology. J. Lépine.—p. 427.
*Reflex Traumatic Contractures and Paralyses by Irritation of Sympathetic. J. Froment.—p. 431.
Attempted Treatment of Mental States Called "Dementia Praecox" by Association of Chrysotherapy and Opotherapy with Sulfur Pyretotherapy. A. Brunerie and R. Coche.—p. 445.

Reflex Traumatic Contractures and Paralysis.—Froment states that, following traumatisms to the limbs, paralysis, paresis and physiopathic contractures are frequently observed. These lesions are usually not, he believes, of a hysterical or psychopathic nature. They often develop above the traumatized area and are frequently accompanied by undeniable evidence of physiologic disturbances, such as disorders of vasomotor and thermal nature, sweat gland alterations, osteoporosis, hypotonias and lowered or increased electrical excitability. The mechanism of such syndromes, which were thoroughly studied during the war, has served as the subject for interminable controversy. Thanks to experimental physiology, it is becoming recognized that these symptoms are the result of a true pathologic reflex involving the sympathetic system. After studying the vasomotor reflexes of the injured limb and of the symmetrical limb of the opposite side and their reactions to diverse thermic factors, as well as the comparative study of the tendon reflexes and motor reactions in the course of chloroform narcosis, he has come to the conclusion that these are frankly disorders of the sympathetic and of the medullary centers of the injured limb. It is certainly not safe to forget the possibility of association with hysterical reactions which may involve the same region, but existence of traumatic physiopathologic syndromes is also incontestable. These lesions are, however, singularly resistant to treatment while remaining for long periods susceptible to exacerbation.

Marseille Médical

72: 733-780 (Dec. 15) 1935

*Acute Generalized Gonococcic Peritonitis, Excluding Ruptures of Pyosalpinx. R. Leclère.—p. 733.

Gonococcic Peritonitis.—Leclère believes that acute generalized gonococcic peritonitis without rupture of the tubes forms a definite clinical picture. The gonococcus, which localizes by predilection in the pelvis, can invade the general peritoneum and thus give the symptomatology of generalized peritonitis. The lesions produced are the same as those which one finds in acute inflammations of the peritoneum of other origin. The diagnosis of this form of peritonitis is difficult, and often surgical intervention alone after a bacteriologic examination of the pus can yield a definite diagnosis. The fear of allowing a peritonitis of other origin to pass without operation calls for surgical treatment. In the majority of cases, simple drainage without salpingectomy is sufficient to cause the cure without interfering with the genital future of those operated on. Sometimes the abdomen can be closed without drainage, especially if bacteriologic examination made at the time reveals the presence of gonococci in the pus. It is only in exceptional cases that it is necessary to perform salpingectomy, and subtotal hysterectomy is definitely contraindicated. Total hysterectomy, furthermore, is wholly unindicated.

Presse Médicale, Paris

44: 1025-1048 (June 24) 1936

*Nervous Syndromes in Cancer of Esophagus. M. Loeper, Mlle. Riom and P. Perreau.—p. 1025.
Action of Mineral Waters in Treatment of Intestinal Disorders. E. Chabrol, R. Charonnat and J. Cottet.—p. 1028.
Massive Right Sided Diaphragmatic Eventration. C. Roubier and H. Boucher.—p. 1030.
Antituberculous Prophylaxis. E. Lesné and G. Dreyfus-Sée.—p. 1033.
Acute Streptococcic Septicemias of Gingivodental Origin. J. Fleury and M. Minière.—p. 1035.
*Animal Carbon by Intravenous Route. R. Démarez.—p. 1037.

Nervous Syndromes in Esophageal Cancer.—According to Loeper and his co-workers, a review of the anatomic relations of various portions of the esophagus with the adjacent nerve elements reveals the fact that, depending on the situation of the cancer, numerous nerve pathways can be affected. With the preliminary knowledge that cancer of the esophagus involves the cervical region in 18 per cent, the bronchial region in 36 per cent and the diaphragmatic region in from 46 to 48 per cent, it becomes clear that nervous complications can be diverse, depending on the localization. Excessive salivation in the course of cancer of the esophagus must be considered a sign of involvement of the nervous system. When this symptom is analyzed more closely, it becomes in reality a symptom of irritation of the vagus. The second important nervous phenomenon is pain. Pain may be preceded by disorders of swallowing or may be localized or carried elsewhere by nerves that are involved. Disorders of phonation, especially dysphonation and aphonia, are frequently seen and seem to be due to involvement of the recurrent nerve, especially the left. Dyspnea is not rare and can take on a suffocating character. Anginal symptoms sometimes occur. Special study of the nerve symptoms which may arise from esophageal cancer therefore reveals the fact that the complications may be numerous and widespread because of the close anatomic relations of the esophagus to numerous nerve trunks.

Death Following Injection of Animal Carbon.—Démarez takes issue with the opinion which has been expressed that animal carbon is more effective the more closely it approaches the colloidal form. In using animal carbon in which the particles were present in a 2 per cent suspension and were for the most part less than 5 microns in diameter, he made an injection in a woman, aged 34, for postpartum sepsis. Death occurred suddenly. Examination revealed that true capillary embolism had occurred and was probably the immediate cause of death. On study of the various carbon preparations, he found that those of small diameter showed a tendency to flocculate and that in all probability this flocculation in the arterioles was the cause of the accident. It is to be concluded therefore that, while the author still believes in the effectiveness of animal carbon, a suspension should not be used in which the particles are less than 5 microns in diameter, but that above this diameter the procedure is entirely harmless.

Sang, Paris

10: 537-660 (No. 5) 1936

Glycemic Equilibrium and Lacunar Storage of Dextrose in Depancreatized Dog. A. Baisset, L. Bugnard, J. Lansac and L.-C. Soula.—p. 537.
*Technic of Puncture of Bone Marrow During Life. G. Karavanoff.—p. 562.
Can a Person Change His Iso-Agglutination Group? P. Moureau.—p. 571.
*Effects of Injection of Antiplatelet Serum in Three Hemophiliac Subjects and One Normal Person. L. M. Tocantins.—p. 582.
Place of Lung in Immunization of Rabbit Against Sheep's Blood Cells. P. de Boissezon.—p. 592.
Progress of Hematology in Last Ten Years. J. Itelson and M. Kocen.—p. 602.

Bone Marrow Biopsies.—After discussing the various technics previously employed in bone marrow biopsies, Karavanoff describes the method which he used. The suprasternal soft tissues instead of being dissected are pierced by means of a special small trocar. Through this the perforating trepan is introduced. After the sternum is thus perforated, the marrow can be removed by means of a small curet or aspirated with a needle. The usual antiseptic methods are employed. Local anesthesia is given as far as the periosteum by means of procaine hydrochloride and epinephrine infiltration, and the puncture is made after anesthesia is complete. As soon as the spongy portion is reached, a definite decrease in resistance is noted in the perforation. The trepan can then be removed and a small curet introduced through the perforated canal. After removal of marrow, the tube of the trocar is withdrawn and tamponing is performed to arrest hemorrhage. A small piece of collodion-soaked cotton can be placed on the skin over the puncture mark. They believe that this method has some advantages, especially in that it is not dangerous. It is simple and safe in all cases and allows a sufficient quantity of marrow to be removed. The possibility of infection is reduced to a minimum, and the ease of obtaining a second specimen is considerably increased. In view of the marked advantages of obtaining such material in a large number of diseases, the authors think that this simple method is a considerable improvement.

Antiplatelet Serum in Hemophiliac and Normal Subjects.—Because of the part played by platelets in blood coagulation, Tocantins attempted the injection of antiplatelet serum

into three hemophiliac subjects and one normal person. The general plan consisted in studying the numerical changes of the erythrocytes and platelets and the coagulation time and the bleeding time at various intervals after the injection of serum. No other treatment was given to the patients during the period of observation. The withdrawal of blood was made at least two and a half hours after a meal. The platelet counts were performed according to the Rees and Ecker method. The normal antiplatelet serum and the hemophiliac antiplatelet serum were prepared in rabbits by five injections of platelets isolated from 30 cc. of the blood of normal and of hemophiliac persons. The term fresh serum was used for that obtained from normal man two or three hours after withdrawal. The serums were always administered by the intradermal route. As a result of their observations on the three hemophiliac and one normal persons, they found that there was an increase practically to normal of the coagulability of the hemophiliac blood but that it did not last long, perhaps because the products of the destruction of the platelets had disappeared rapidly from the circulation or had been neutralized. The phase of normal coagulability apparently began between three and five hours after the injection and lasted for about twelve to twenty-four hours. The phase of normal coagulation was not accompanied by a rapid or immediate arrest of hemorrhage in two patients who received the serum. The local application of the serum was without appreciable effect. The direct addition of normal antiplatelet serum and hemophiliac antiplatelet serum to hemophiliac blood in vitro was followed by a decrease in the coagulation time of about 84 per cent, while when normal antiplatelet serum was mixed with normal blood there was a reduction of 18.5 per cent in the coagulation time. It is difficult to judge of the effectiveness of the serum as a therapeutic agent, since the spontaneous cessation of hemorrhage is a phenomenon often observed in these patients.

Clinica Medica Italiana, Milan

67: 435-506 (July) 1936

Venous Blood Pressure with Arm in Horizontal and Vertical Positions in Several Pathologic Conditions. M. Bassi.—p. 437.
*Metabolism of Carbohydrates in Splenomegaly. A. Romeo.—p. 468.
Undulant Fever with Respiratory Symptoms: Function of Liver and Biochemistry of Blood. T. Galli.—p. 477.
*Behavior of Glycemia Following Administration of Derivatives of Human Bile. F. Molfino and V. Patrono.—p. 493.
Action of Lung on Oxalic Acid in Blood. A. Chierici.—p. 501.

Metabolism of Carbohydrates in Splenomegaly.—Romeo made determinations of glycemia in fourteen persons with chronic malarial splenomegaly but without fever. The determinations were made before and after administration of 100 Gm. of dextrose by mouth. The author concludes by saying that chronic malarial splenomegaly is associated with hypoglycemia that does not change or slightly changes by administration of dextrose. The hypertrophic spleen has an action on the metabolism of carbohydrates, as proved by the presence of hypoglycemia and the lack of reaction or slight reaction of the glycemia curve after administration of dextrose to the patient, which action is due to the presence in the blood of a hormone having glycolytic properties secreted by the spleen, but still unknown. An intravenous injection of 5 cc. of pure spleen extract given to normal persons with normal fasting glycemia caused a slight increase of glycemia in all cases.

Glycemia Following Administration of Bile Derivatives.—Molfino and Patrono made determinations of glycemia before and after administration of certain derivatives of human bile in normal persons and in patients suffering from diabetes mellitus. Both normal persons and diabetic patients were placed in three groups: those who were given an intravenous injection of 10 cc. of a 20 per cent sodium dehydrocholate solution, those who were given 2 Gm. of dehydrocholalic acid by mouth and those who were given a hypodermic injection of 4 cc. of a 2 per cent sodium cholate solution. The determinations were made on a fasting stomach. Glycemia increased slightly or did not change in persons of the first group and decreased or did not change in the persons of the second and third groups. It is not possible to know whether the changes of glycemia following the administration of bile derivatives are due to an action of the latter on the liver or on the pancreas.

Rassegna Internazionale di Clinica e Terapia, Naples

17: 529-576 (June 30) 1936

*Posterior Tuberculous Sacral Para-Arthritis. D. Taddei.—p. 531.
Undulant Fever Apophyseal Arthritis: Case. P. Oreto.—p. 538.
Anterolateral Thoracoplasty by Monaldi's Technic in Pulmonary Tuberculosis. F. Buonomo La Rossa.—p. 544.
Vomiting in Children. C. De Ritis.—p. 549.

Posterior Tuberculous Sacral Para-Arthritis.—Taddei calls tuberculous sacral para-arthritis the disease reported in the French literature with the name of partial or atypical forms of sacro-iliac tuberculous arthritis. The condition is neither an atypical nor an incomplete form of sacro-iliac arthritis, but a localization of tuberculosis at the epiphysis near the symphysis of the sacro-iliac joint. Both arthritis and para-arthritis of the sacro-iliac joint originate in the primary para-symphysial tuberculosis, but their clinical picture and evolution are different. In arthritis the joint is involved and there is no abscess formation. In para-arthritis the joint is spared in the process and an abscess is formed. Tuberculous sacral para-arthritis develops in two periods, one of intense pain of the type of rheumatic sciatica, which does not improve by rest of the patient, and one of amelioration of the pain and formation of a parasymphysial abscess. There is only one internal painful spot above the fistula which persists all through the disease. Of most diagnostic value, however, is the presence of rigidity of the vertebral lumbar segment to flexion but not to extension of the column. Rigidity of the vetebral segment is characteristic of tuberculous sacral para-arthritis and is of value in the differential diagnosis with Pott's disease, tuberculous sacro-iliac arthritis and other vertebral and sacro-iliac pathologic conditions in which it does not exist. The treatment of tuberculous sacral para-arthritis depends on the evolution, either anterior or posterior, of the abscess. In some cases the abscess develops anteriorly and opens spontaneously in the pelvis or the internal organs. In these cases the common treatment of tuberculous abscess gives satisfactory results. In other cases the abscess develops posteriorly into the gluteal insertions, through which it spontaneously opens to the exterior, leaving a fistula. Para-arthritis of posterior development is grave. The treatment is surgical and consists in removal of the cutaneous ulcer, the wall, the abscess and the fistulous tract and in scraping or typical resection of the tuberculous focus of the bone. A case of posterior development is reported in a patient, aged 19, suffering from pulmonary and lymph node tuberculosis.

Prensa Médica Argentina, Buenos Aires

23: 1677-1730 (July 15) 1936

*Magnesium Sulfate in Crisis of Asthma. H. J. Rosello and J. C. Plá.—p. 1677.
Time of Ventricular Evacuation per Minute: Electrocardiographic Determination and Physiopathologic Significance. J. Duomarco.—p. 1682.
Heterotaxis and Thrombo-Angiitis. A. Bergman and L. Dragosky.—p. 1694.
Primary Tuberculous Infiltration of Skin in Childhood: Skin as Port of Entry of Tuberculosis. A. A. Magalhaes.—p. 1700.
Acute Hemorrhagic Edema in Infant. M. J. del Carril, I. Díaz Bobillo and J. Vidal.—p. 1719.

Magnesium Sulfate by Vein for Asthma.—Rosello and Plá state that the intravenous injection of a 10 per cent solution of magnesium sulfate, in doses of from 10 to 20 cc. each, produced an intense and immediate sedative effect in an asthmatic patient during a crisis which had failed to respond to epinephrine, ephedrine, solanaceous drugs, atropine and morphine. The action of magnesium sulfate, however, is transient and the injections have to be repeated in order to maintain the antispasmodic effect until the crisis disappears. The injections should be given slowly. The authors have not exceeded a 10 per cent solution. It is possible to inject calcium chloride immediately after the magnesium sulfate if an intense reaction develops. Magnesium sulfate, because of its antispasmodic properties, gives satisfactory results in cases of cortical or reflex hyperexcitability of the central nervous system (eclampsia, tetanus, chorea, strychnine poisoning and certain sequels of parkinsonism). Magnesium thiosulfate gives satisfactory results in certain conditions of shock (including asthma) and in other paroxysmal conditions. The authors cannot state as yet whether

magnesium sulfate, besides being an antispasmodic, may have regulating properties of the equilibrium of the humors, the blood plasma and other factors that may take a part in producing the crisis of asthma, a question that they promise to clarify in the near future by animal experiments.

Semana Médica, Buenos Aires

43: 73-144 (July 9) 1936. Partial Index

Colon Bacillosis in Pregnancy. N. Palacios Costa and A. Peyloubet.—p. 73.
*Reciprocal Influence of Blood Bilirubin and Blood Urobilin Eliminated Through Bile. M. Royer and A. Speroni.—p. 89.
Syphilis by Contagion in Girl, Aged 5: Case. A. Aurelio Fernández and L. Iapalucci.—p. 91.
Pseudobulbar Syndrome. R. Soto Romay.—p. 100.
Spinal Anesthesia in Labor. R. L. Gavioli.—p. 119.

Bilirubin and Urobilin.—Royer and Speroni studied the reciprocal influence of blood bilirubin and blood urobilin when the elimination of the pigments through the bile was induced by the intravenous injection of either pigment. The influence was evaluated by the changes of the bilirubin-urobilin ratio in the canalicular bile, obtained by duodenal sounding in three cholecystectomized persons. Following the intravenous injection of bilirubin, the bilirubin secretion increases in the bile. The urobilin secretion slightly increases, but the curves of both secretions are independent. The bilirubin-urobilin ratio shows great variations in a few minutes. Following the intravenous injection of urobilin in doses of 2 mg. of urobilin for 5 Kg. of body weight, the bilirubin secretion in the bile increases five times as much as it was before the injection, while the urobilin secretion increases thirty-two or forty-eight times as much. The bilirubin-urobilin ratio greatly decreases. The authors say that, although there is a reciprocal influence between blood bilirubin and urobilin in their elimination through the bile, the bilirubin-urobilin ratio varies in the same person and under the same conditions, according to the amount of either pigment in the blood.

Archiv für Gynäkologie, Berlin

162: 1-204 (June 20) 1936. Partial Index

Experimental Investigations on Rôle of Uterus in Sexual Hormone System. P. Hauptstein and E. Bühler.—p. 1.
Mesenchymal Angioma of Placenta. J. Beaufays.—p. 14.
Pregnancy After Treatment of Functional Disturbances of Gonads with Gonadal Hormones. T. Beckmann.—p. 21.
*Intra-Uterine Function of Fetal Lung and Liver. B. Szendi.—p. 27.
Virulence of Bacteria in Sphere of Gynecology and Obstetrics. T. Koller.—p. 53.
Fetal Lipoid and Fatty Acid Metabolism. G. Effkemann.—p. 148.
*Demonstration of Presence of Metabolically Active Substances from Ovarian Follicle. K. J. Anselmino and F. Hoffmann.—p. 176.

Intra-Uterine Function of Fetal Lung and Liver.—Szendi searched in human and rabbit embryos for the organs that influence the intra-uterine carbohydrate metabolism. He investigated the glycogen content of the organs of spontaneously and artificially aborted fetuses. He found that the lungs and the liver develop into glycogen organs. The glycogen content increases and decreases independently of the growth or weight of these organs, but a certain regularity is perceptible which is connected with the anatomic structure. This and the considerable accumulation of carbohydrates indicate that these organs with their great masses of glycogen take part in the regulation of the carbohydrate metabolism of the fetus. Lungs and liver act alternately on the fetal carbohydrate metabolism, for first it is done by the lungs (in human embryos between the second or third and the sixth or seventh months and in rabbits between the eighteenth and twenty-fifth days). During this time, the liver is active in the formation of blood. After that, however, the liver gradually assumes a greater importance in the carbohydrate metabolism, for during this time lungs and liver are being prepared for their extra-uterine functions. The author concludes that, during the intra-uterine period, the lung is not merely a developing organ, as was believed formerly, but takes part in the carbohydrate metabolism; that is, it has a function which differs from its extra-uterine activity. He found also that heart and muscles have comparatively large quantities of glycogen and believes that the glycogen in the muscles is probably a secondary carbohydrate reserve. He observed that, on the whole, the fetal organs contain more glycogen than do the organs during postnatal life, and he assumes that they probably require it for their development, for the intensive increase in cells and for other functions as yet unknown.

Metabolically Active Substances from Ovarian Follicle.—Anselmino and Hoffmann demonstrate that purified extracts from ovaries and from follicular juice, which are free from corpus luteum hormone, produce in the animal experiment a number of characteristic metabolic effects. For instance, they observed after the administration of active extracts an increase in the basal metabolism, a heightening of the blood calcium level, an increased formation of ketone bodies in the blood and an intensified insulin blood sugar action. In contradistinction to this, the crystalline alpha follicle hormone, which is obtained from pregnancy urine, and the dihydrofollicle hormone proved entirely inactive, just as the extracts prepared in the same manner from liver and spleen are without metabolic action. From these observations the authors conclude that the estrogenic hormone, which is extracted from the urine and assayed according to the Allen Doisy test, is not identical with the metabolically active components of the ovarian follicles. The extracts investigated by the authors exert their action (as regards basal metabolism and calcium content of the blood) by a stimulation of the incretory glands, for they are inactive after removal of the thyroid and the parathyroids. The exact action mechanism, however, is not understood as yet. After calling attention to the isomeres or related substances of the estrogenic hormone, which have been prepared by chemists from pregnancy urine, the authors state that they tested the metabolic action of two such substances and found that they lacked a metabolic action. They reach the conclusion that it is no longer permissible to regard the alpha follicle hormone and the dihydrofollicle hormone as the only active substances of the follicle. They point out that certain clinical observations, such as the unsatisfactory results obtained in menopausal disorders with the estrogenic substance extracted from the urine, corroborate their opinion. They advise that in the future more attention be given to the metabolically active substances of the ovary.

Jahrbuch für Kinderheilkunde, Berlin

147: 1-64 (June) 1936

Clinical Studies on Behavior of Reticulocytes in Blood Diseases During Childhood. W. Heuberger.—p. 1.
Adenosarcoma and Subacute Elimination Pyelography. J. R. Dreyfus.—p. 12.
Incontinence of the Feces in Girl, Aged 9, with Congenital Syphilis. W. Mikułowski.—p. 23.
Correlation of Cecal Appendix and Liver in Clinical Conditions in Children. W. Mikułowski.—p. 29.
*Icterus Gravis with Eclampsia in Child During First Year of Life. E. Lohse.—p. 40.

Icterus Gravis with Eclampsia in Child.—Lohse reports the history of a boy, aged 11 months, the fifth child of apparently healthy parents. However, two of the other four children had died, one at the age of 4½ months, as the result of intestinal catarrh, and one after three days with cerebral symptoms. The child under consideration had been subject to attacks of twitching and rigidity but allegedly had never had nutritional disturbances. The child had once been treated for catarrhal conjunctivitis and once for a mild bronchitis. The Wassermann reaction was negative twice. The present disorder began with fever three days before hospitalization and terminated fatally on the sixth day after admittance. The author gives a detailed description of the clinical and histologic aspects. In discussing the case he says that two processes apparently developed in the liver: a chronic disorder, namely, a diffuse proliferation of the connective tissue and of the bile ducts, and an acute process in the form of a fatty degeneration of the liver cells, focal hemorrhages and necroses, and increase in cells without signs of organization. Since syphilis can be excluded, it must be assumed that the child had been subject to repeated intoxications, probably of an alimentary nature. Their cumulative action produced chronic changes similar to those appearing in syphilis, but at first they did not result in insufficiency of the organ. A last acute intoxication led to complete failure of the hepatic function. This together with an acute disorder of the kidney was followed by the fatal outcome with severe cere-

bral symptoms. To be sure, it is surprising that the anamnesis does not indicate such disorders. The author suggests that mild toxic impairment may perhaps have been overlooked. With regard to the eclamptic symptoms, which developed on the last day, he says that cerebral symptoms are not unusual in the course of icterus gravis, in that they are a manifestation of a hepatic autointoxication. The character of the disorders (alimentary intoxication and eclampsia) in the two other children, who had died, suggests a predisposition in the children of this family.

Zeitschrift für Tuberkulose, Leipzig

75: 145-224 (June) 1936. Partial Index

Roentgenologic Demonstration of Different Layers (Tomography) in Pulmonary Diagnosis. J. W. Sopp.—p. 145.
Infectious Diseases and Tuberculosis. H. Starcke.—p. 158.
*Significance of Psychic Factors for Outbreak and Cure of Pulmonary Tuberculosis. D. Barglowski.—p. 162.
*Serodiagnosis of Tuberculosis (Meinicke's Tuberculosis Reaction and Complement Fixation Reaction with Methyl Antigen of Nègre and Boquet). J. Zeyland and E. Piasecka-Zeyland.—p. 171.
Relation Between Pulmonary Tuberculosis and Terminal Vessels in Human Skin. G. Sadowski.—p. 175.

Psychic Factors in Pulmonary Tuberculosis.—Barglowski maintains that a detailed psychic anamnesis of patients with pulmonary tuberculosis reveals frequently that the outbreak of the disease was preceded by psychic conflicts. He reports the psychic anamneses of five patients which indicate that psychic conflicts and traumas are at least contributing factors in that they reduce the resistance of the organism and thus prepare a favorable field for the action of the tubercle bacilli. Since the psychic conflicts persist frequently after the outbreak of the disease and are likely to exert an unfavorable effect on the curative process, psychotherapy is advisable for such patients.

Serodiagnosis of Tuberculosis.—Zeyland and Piasecka-Zeyland made 763 flocculation tests according to Meinicke's vault or curvature method. However, they limit their discussion to the 479 cases in which the existence of tuberculosis was definitely established. In 148 cases they compared the results with those of the complement fixation test according to Calmette-Massol with the methyl antigen of Nègre and Boquet. The authors reach the conclusion that, although its technic is simple, the Meinicke reaction is as reliable as the best complement fixation tests, and it is even superior to the complement fixation test made with the methyl antigen. However, its value for the diagnosis of tuberculosis is nevertheless slight, for it gave positive results in 80 per cent of the adults with tuberculosis, in 20 per cent of the control cases (nontuberculous serums) and in only 50 per cent of the children with active tuberculosis.

Norsk Magasin for Lægevidenskapen, Oslo

97: 665-784 (July) 1936

Endometriosis and Transplantation of Endometrium. H. F. Harbitz.—p. 665.
*"Tumor Colli" As First Symptom of Malignant Tumors in Throat, Tonsils and Neck. L. Kreyberg.—p. 681.
*Xanthomatosis and Sudden Death. F. Harbitz.—p. 695.
Syndactylia Treated According to Method Proposed by R. Klapp. I. Schjøth-Iversen.—p. 700.
Amusia. H. J. Ustvedt.—p. 705.
Experiences in Analytic Consultation. J. I. Strømme.—p. 717.

"Tumor Colli" as Symptom of Malignant Tumors in Throat.—Kreyberg says that a tumor in the neck is often the first symptom in this group of tumors, which presents three main types: transitional cell carcinomas, lympho-epitheliomas and reticulosarcomas. In a number of cases histologic differential diagnosis between these types is simple; in other cases differential diagnosis is impossible with the present technic. The reticulosarcomas are tentatively divided into three subgroups: (1) those with alveolar growth, (2) those with diffuse, syncytial growth by rather uniform cells and (3) those with diffuse growth by individual, more polymorphous cells. Except when the primary tumor is in the lymph nodes of the neck, it is usually in the nasopharynx or tonsils. Every case of a lump in the neck in an adult calls for examination of the throat by a competent rhinologist if the cause of the tumor is not evident. An amateur in rhinoscopy may easily miss a primary silent tumor in this region, as it appears only as a small flat infiltration of the nasopharyngeal wall. All these tumors are to be regarded as roentgen sensitive, some to a marked degree, and treatment is mainly roentgenologic. Prognosis is as a rule grave, because of metastasis formation. Improvement in the results depends chiefly on earlier diagnosis. Nineteen certain and two doubtful cases are reported.

Xanthomatosis and Sudden Death.—Harbitz describes a case of sudden death in a man, aged 46. There were hard nodular, yellow deposits 3 or 4 cm. long on the backs of his hands and coherent with the tendon sheaths. Microscopic examination showed typical xanthomas. The heart was hypertrophic, somewhat infiltrated with fat, and in the right and especially in the left coronary artery were considerable deposits of yellow-white masses, which had caused strictures in various places. Similar deposits, intensely yellow, were also present in the aorta opposite the valves and to a greater extent in the abdominal aorta. The cholesterol content of the blood plasma was normal: 171 mg. per hundred cubic centimeters. The author states that two patients with a history of multiple xanthomas beneath the skin in childhood, described by him in 1925, died suddenly, both at the age of 22. Necropsy performed in one case revealed large xanthomatous deposits in the aortic valves and in the aorta, with stenosis and hypertrophy of the heart. At 18 this patient's blood plasma had contained from 470 to 547 mg. of cholesterol esters per hundred cubic centimeters. The father of the other patient, five paternal uncles, an aunt and an uncle on the maternal side had xanthomatosis, although in far less marked form; two brothers and a sister were well.

Ugeskrift for Læger, Copenhagen

98: 677-698 (July 23) 1936

Remarks on Exophthalmic Goiter, Especially Its Relation to Nervous System. P. Levison.—p. 677.
Investigation on Adaptation Ability in Student Nurses at Rigshospital. Eva Friis-Skotte.—p. 680.
*Acquired Tertiary Pulmonary Syphilis. E. Strandgaard.—p. 682.
Dick Reaction and Relations of Immunity in Scarlet Fever. O. Brinch.—p. 689.
Report from Practice: Treatment of Panaritium According to Orr. A. Schiermacher.—p. 690.

Acquired Tertiary Pulmonary Syphilis.—Strandgaard reports one certain and three probable cases of this disorder, all seen within a year, which, he says, shows that the disorder, though rare, is a possibility to be considered in the diagnosis of chronic pulmonary disturbances. In the first patient, a woman, aged 43, without known preceding syphilitic infection, a chronic progressive pulmonary ailment marked by pronounced dyspnea and cyanosis set in at the age of 38. The Wassermann reaction was positive; no tubercle bacilli were found. Necropsy revealed an extensive fibrous shrinking pulmonary process. Histologically there was marked fibrosis without signs of specifically tuberculous tissue. The macroscopic and microscopic diagnosis was chronic fibrous syphilitic pneumonia. The other patients were men. In one, without known syphilitic infection, signs of tabes dorsalis developed at the age of 38, with simultaneous cough and expectoration subordinate to the tabetic symptoms but continuing unchanged for about twenty years. There were stethoscopic signs of a chronic process basally in the lung, and roentgen examination showed clarifications surrounded by fibrous parts. The Wassermann reaction was negative. The next patient, infected with syphilis at the age of 18, had apparently been well until 50, when coughing with expectoration began and continued for about ten years. Fibrous processes were seen in the lower part of both lungs. The Mantoux reaction was negative, tubercle bacilli were not found and the Wassermann reaction was positive. Treatment with arsphenamine and potassium iodide produced no decisive changes in the picture. The last patient, at the age of 44, had a recent syphilitic infection, which was treated energetically. It was shortly followed by continuing cough and expectoration. Nine years later there were signs of chronic pulmonary disturbance at the base of both lungs. The Wassermann reaction was not negative; there were no tubercle bacilli in the sputum. Long continued treatment, partly antisyphilitic, partly with short wave diathermy, partly with roentgen rays, brought no decided improvement.